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FERRANTI
Computer Systems

Logica sets date for Cambridge Ring

SUCCESS with its in-house Cambridge Ring network has led Logica to lay plans for selling the system as a general purpose networking product during the first half of 1981. Standard access logic boards for common equipment such as the PDP 11 Unibus will be available. Logica's own development work is with word processors, in which VT500 stand-alone units can talk to each other or to two 300 megabyte discs, producing a kind of "distributed shared-logic system" (CW, November 8, 1979).

US network for Euro debut soon

A LOCAL networking system developed in California is ready to be sold into Europe in bulk, only four months after US deliveries began. Called Net/One, the system is made by Ungermann-Bass, a company set up last year in the heart of Silicon Valley by two top ex-Zilog people.

One of them, Ralph Unger- man, had been a co-founder and the other, Charlie Bass, general manager for microcomputer systems.

Based on coaxial cable links and multi-microprocessor network interface units, the system uses a processor-independent Ethernet-like protocol compatible with the version developed jointly by Xerox, Intel and Digital Equipment with the aim of establishing a standard for local networking.

Up to 250 network interface units, each with up to 15 devices attached, can link to a single network segment and these can be chained together so that ultimate capacity is said to be virtually limitless.

Each cable can be 4,000 ft long and carries data at 4 Mbps. Devices attach to the interface unit through a serial RS 232C port or a 16-bit parallel port based on the Zilog Z80 PIO interface chip and can transmit at up to 200K-bps in bursts.

It is also possible to attach directly to the processor-independent internal bus of the network interface unit and transmit in bursts at up to eight megabytes per second into the buffer area.

Cost works out at between \$500 and \$1,000 per device attached. First European delivery was to Lausanne Polytechnic, Switzerland.

NEWS IN BRIEF

Double boost for Cray

SERVICES firm United Computing Systems is to upgrade its Cray 1 to a Cray 1S with twice the memory. The million word machine is due for delivery in December and will be available by January 21 and 22.

Cray Research is to extend the lease on its system at the UK's Science Research Council at Daresbury until 1983.

IBM great . . .

IBM has reported a strong boost in third quarter profits, up 32 per cent over last year's poor third quarter at \$884 million on turnover up 20 per cent at \$6,400 million. The increase in profits is attributed primarily to a strong sales to rentals ratio.

NCR good . . .

NCR has reported net profit for the third quarter up 15 per cent at \$54.5 million on turnover up 12 per cent at \$792.3 million. It reported slight advance in incoming orders during the quarter.

Burroughs bad

NOTHING is going right for Burroughs at the moment. After its very poor showing in the UK and German sections of the Datapoll (CW, October 9), the company has had its second profit setback running. Third quarter profits fell almost 32% to \$42.2 million on turnover up 4% at \$695 million.

Univac gives ICL an opening in the US

Prices start from £4460 for the MP100 and £5076 for the MP200 systems. Systems range from floppy disc through cartridge to Winchester storage.

Comma offer 'off the shelf' delivery of complete Micro Nova Packaged Systems as well as Expansion Memories, Communications Options, Interfaces and comprehensive Operating Systems Software.

Data General Printers and Dasher Terminals are also available ex-stock.

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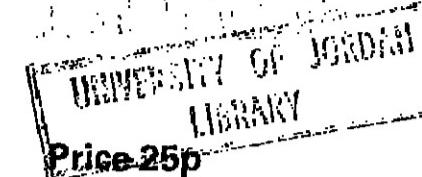
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The competition judges (left to right) Steve Shirley of F International, John Major (background) of the Doe, and Walter Beveridge, HM Inspector of Schools, Scotland, examine an entry in the Doe's mini competition

Japan to develop 10,000 megaflop

A SUPERCOMPUTER with a similar parallel architecture to ICL's Distributed Array Processor but with a power rating of up to 10,000 million floating point operations a second could be available in operation in Japan by the end of the decade.

The increase reflects a higher demand for the paper created by the growth in the computer market - a growth

we continue to share.

Computer Weekly has reached a steadily increasing readership since it was launched as the first of its kind in this country in 1966. Then in this country in 1966. Then the circulation was just 10,000.

The new figure will be revealed in returns to be published by the Audit Bureau of Circulations (ABC) for the January-June period this year.

It is performance will be achieved by employing Josephson Junction or Gallium Arsenide semiconductor technology in each of the microprocessors in a 32 x 32 array.

The 10,000 megaflop machine will be developed by the Agency of Industrial Science and Technology, part of the Japanese government's Ministry of International Trade and Industry, at a cost of around £60 million.

The eight-year project is expected to start next year and will be carried out by engineers previously involved with the four-year MITI-sponsored VLSI development programme which ended earlier this year. That programme cost about £120 million, half of which was provided by the government and the rest by five major Japanese-based computer manufacturers, Fujitsu, Hitachi,

Mitsubishi, Nippon Electric and Toshiba.

The 10,000 megaflop parallel processor is intended mainly for government use in areas like nuclear research and meteorology, and MITI hopes that its development will contribute to the government's ambitious but very long-term fifth generation computer programme, which at present is at the study stage.

But one of the key characteristics of the fifth generation is assumed to be the dominance of processors employing architectures different from the conventional von Neumann approach.

VLSI man for IBM

A KEY executive of two Japanese government-subsidised high technology computer organisations has resigned and is about to join IBM Japan, a growing competitor for Japanese-based companies in the VLSI development race.

Matsuo Nebashi was managing director of the VLSI Technology Research Association and also of the Electronic Computer Basic Technology Association which was set up to promote the development of Japanese

systems software. Both organisations are affiliated to MITI, the Ministry of International Trade and Industry.

Nebashi has confirmed the move but has yet to disclose any further details about his departure to the computer industry giant.

He has been a noted figure in the field of VLSI technology, having founded the Japanese VLSI Research Association in 1978.

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COMPUTERVIEW

THE current recession is the third to hit the world economy since 1970.

In the first, the computer industry suffered hard, with major companies like RCA and General Electric finding the pace too hot and leaving the mainframe business.

In the second, the computer industry was much less severely affected, and the two major withdrawers were those of Xerox and Singer — although in Europe marginal mainframers Philips and Datasaab threw in the towel also.

This time the computer industry is riding the storm with scarcely more than a touch on the tiller to avoid its worst ravages.

Third quarter figures from five of the big US mainframes — IBM, Honeywell, Burroughs, NCR and Control Data — are mixed, but those reporting storm-damaged figures — Burroughs and Honeywell — attribute them primarily to production problems which can hit companies in good times and bad, not to the recession itself.

In Europe, ICL is implementing a broad range of cost cutting measures, concentrating resources on the two most vital areas, selling and research and development, at the expense of the important but ultimately discretionary activities that come between.

The company will report in 1979-80 figures at the end of the year with less than eupho-

The DP industry has come of age

ria, but there is no evidence that it is in any kind of serious trouble.

Siemens is still looking forward to a good year on mainframes, having at last got its computer operations into profit.

Only CII-Honeywell Bull's figures have looked seriously storm-damaged, but the company always does much better in the second half of the year, and now has the financial resources of St Gobain behind it.

Among the US minifirms, only General Automation still looks in serious trouble, and is too large a company not to find a rescuer if that should become necessary. Computer Automation seems to have sorted out its problems in double-quick time, and, like Infors, ran into trouble with no help from recession.

The semiconductor manufacturers still look substantially recession-proof, and it is primarily to small companies — systems houses and OEM systems builders — that one has to look for the likely casualties.

At the time of the 1973 recession, we expected a major slump in job opportunities which never came. So far, all the evidence from Computer Weekly's back pages is that the softening in demand for people is shown up in comparisons with the boom time of 1978 and early 1979 rather than against the underlying trend.

Yet fear is much more widespread than time that it was during the last recession. Staff turnover among Civil Service computer personnel has slumped from a usual 15% per annum to 5% or 6% this year.

The implication of this is that staff are sitting tight while 18 months ago they might have considered a move; a job held is worth two in prospect.

However, the shortfall of the right computer people remains, and so the classified pages still burgeon with unfilled jobs.

This dispenses a serious recessionary problem: anything which is draconian tends to get shelved. The implication of this

is that companies in the field would appear to be the most though so far there is no major computer companies which offer what on the back of data processing user pinch lead.

On the employment front, the element is clear. Computer has received many letters from page 10P courses which cannot get jobs; they have no experience when to other handicaps, the prospects worse. On a TOPS course for people at Queen Elizabeth II Leatherhead, only three out of 11 have so far managed to find a job (see page 5).

All the evidence, therefore, is that computer industry has reached its peak, and is as near recession-proof major economic activity can be.

And as far as the UK is concerned, the cities of unguish from idea about the catastrophic effect of the pound, one of the few bright spots economic scene is the continuing exports. The success of the ICL international markets suggest that computer industry is making its bid for recession.

The smallest member of the family, the Atlas 723A is a table top single user system costing from £6,790. It runs on the LSI 11/2 processor with 61K-bits of RAM and a dual drive floppy disc with 2.5 Mbytes of memory. It can be upgraded to an Atlas 733, which is LS1-11/23-based and can support up to four users.

The largest in the family is the Atlas 736 costing £14,650. All

£200,000 order from French systems builder

AT the same time as launching its family of Atlas LS1-11 based systems, Karlin Computer Services has received an order worth over £200,000 for 50 systems from French systems builder, Institut Programmatique et Cybernetic.

The Atlas family, which comprises eight DEC LS1-11/2 and LS1-11/23-based systems, is being manufactured at the company's new plant in Hayes. KCS claims to be able to produce 50 systems a month and expects to ship at least 200 systems in the UK by the end of next year.

The new terminals are the MPT/80, 83 and 87. They are compatible with the full range of Data General minicomputers. They run under the MPOS real time operating system and support Pascal, Fortran and assembler.

It supports up to four terminals and up to 50 megabytes on disc. A 60 cps and a 300 lpm printer are offered with it.

Timeplex court threat hangs over Racal-Milgo

THE end, this month, of the exclusive multiplexer marketing agreement between Racal-Milgo and Timeplex has left the prospect of legal action between the two. Timeplex is apparently unhappy with Racal's marketing efforts on its behalf.

Timeplex president, Edward Bowinick refused to talk about the future relationship between the two companies last week because he said his company is contemplating litigation against Racal-Milgo.

Last week both companies launched a whole clutch of new data communications products, some in direct competition with each other (see page 15).

Until this month, Racal marketed Timeplex multiplexers in Europe, Africa and the Middle East under an agreement that was exclusive for both parties.

But Racal has now developed its own range of statistical multiplexers (CW, September 4) while Timeplex has set up its own UK subsidiary (CW, March 20) and signed up 12 distributors in the rest of Europe, including ones in

LETTERS to the EDITOR

Outmoded languages for microprocessors

ROY ATHERTON (Letters, October 9) is right to question the merits of using outmoded languages such as Fortran and Basic in an educational context. But buyers of micros, in whatever context, are frequently more concerned with availability, reliability, ease of service and value for money, when choosing and selecting a machine to meet their needs. This is why micros like the Pet and Tandy are so popular.

The common denominator with these micros is the language Basic, and if anyone is considering developing software for use on many different micros then using Basic is likely to give it the widest acceptability and portability.

This pre-processor is really only an intermediate step. Basic as a standard should have "structuring" logic, i.e. "DO WHILE", "IF-ELSE-ENDIF", etc to bring it up to date. Cobol is going to have these features in its next release, so why not Basic?

D. BURDETT
Senior Consultant
BIS Applied Systems,
London S1 7UT.

I am beginning to collect experience of teaching general managers the use of microcomputers. In my view the majority of UK managers (about 70 per cent) have resisted the mainframe computer revolution completely. The second revolution will be less easy to resist

her a different "person" about.

The problem of teaching managers is their lack of numeracy. The lack, mainly in the older managers, seems general. I would appreciate it if readers could comment on the perceived problematical nature of using Basic to teach micros.

I have had UCSD Pascal running on my Tandy TRS-80 Model I for several months, and an excellent Pascal implementation has just become available for the Pet.

L. F. HELLER
Bradford University

Newport Pagnell, Bucks.

THE EDITOR welcomes letters commenting on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication.

Prof. A. J. T. COLIN
Dept of Computer Science,
Strathclyde University.

IN reply to Roy Atherton's letter (CW, October 9) headlined "Years ahead of the Tandy and Pet", I write to let you and your readers know that we are teaching Pascal to some 200 first-year students, using Commodore Pet as the vehicle. To the best of my knowledge the Pet is the cheapest way of providing interactive Pascal at present.

Prof. A. J. T. COLIN
Dept of Computer Science,
Strathclyde University.

Herein lies a dilemma, either to use a popular "unstructured" language like Basic or a less widely available "structured" language like Pascal. Within BIS we identified this problem some two years ago and so have developed a pre-processor for Basic which enables programs to be written in a "structured" form. These programs are completely independent of GOTO statements and line numbers.

WHAT Roy Atherton says is very true (CW, October 9). I remember a very enjoyable evening we spent together in discussing this very point. The problem is that I am in the business of training people to fill the needs of the present com-

puter industry. You have only to look through the pages of your newspaper to see there is not really a market for Pascal probably or Cobol 80 and this is really the trouble with education, isn't it? If we are not careful we try to lead the field instead of meeting the needs of industry as they are now.

It would be very interesting to find out the percentage of programming jobs that are for Cobol programmers, and then the percentage of those older children

who are being taught programming who are learning Cobol. You could do the same with Basic and Fortran.

Nous ne vivons jamais, mais nous espérons de vivre; et, nous disposons toujours d'être heureux, il est inévitable que nous ne le soyons jamais. — Pascal.

PAUL BRÄTSCH
C.I.O. Computer Studies
HM Prison,
Leyhill,
Wotton-under-Edge,
Gloucestershire.

1984 and all that

CONTRIBUTIONS from readers are welcome for our column of strange things people say in the media about computers. We will pay £5 for each item we publish.

I have just been reading, for the umpteenth time, an article pointing out that there is no such thing as a stupid computer. Only stupid people.

Next question: why, then, do all computers have stupid programmes?

The reception desk at my New York hotel had a computer which spent

vacant room, now takes 15 minutes. It used to take 15 seconds.

If any hotelier in this country is tempted to install a similar interval of time.

Technology will give some added free of charge, that will save him millions.

It doesn't work.

Applications for copies of the Operational Requirements should be sent to the CENTRAL COMPUTER AND TELECOMMUNICATIONS AGENCY (Con. SA/1), Glengariff House, Upper Green Lane, NORWICH NR3 1DW quoting the appropriate Reference No. November 1980.

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Pascal

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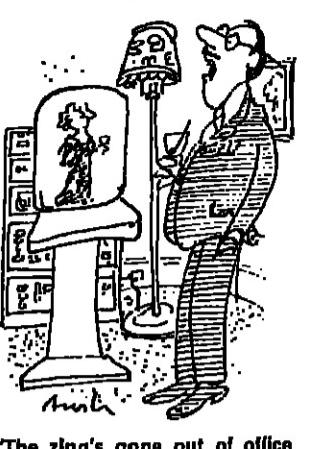
Downtime

by Chas

Love will sniff at locksmiths

ACCORDING to the managing director of Mastiff Security Systems, future computerised door controls and the like will recognise people by extra-sensory perception. This is an interesting idea. I am trying to imagine what the transducers for ESP will consist of. The only thing is, once you have invented a transducer for ESP, it's no longer extra-sensory, is it? It would be even neater to invent a computer with clairvoyance. Then it could leave all the doors open until someone came along who was going to do something naughty, and then slam the doors in its face.

Other slightly more feasible means of identification the Mastiff man mentioned were visual recognition and smell. "It's a wise computer that knows its own master." Never mind that the Feebles and the Smellies are supposed to be outstanding anomalies in Brave New World. Why spend all that money on chips and circuit boards when a nice homely basset hound will do the trick?



Signs are that the Japanese face change

As the folks at The Times slowly get around to thinking about starting to use their computerised production equipment that has been lying around in varying states of readiness for the last three years, the Daily Telegraph has just installed a Prestel set. Telling me this, a reporter proudly remarked: "This is the first piece of Twentieth Century technology that newspaper has acquired."

I was about to remind him about ballpoint pens, and then I noticed that he was writing with a fountain pen!

A friend of mine finds this inventing of new words especially grating. "What," he asks, "do they call the application of computers to aviation?" Aerotronic?

makes all the difference in the world, because they can use key boards for type entry instead of those enormous racks of little metal blocks with characters on them.

This point was made by the recent Horizon programme called Goodbye Gutenberg. Because of the difficulty of writing anything in Japan, office procedures there have developed along totally different lines from the rest of the West. Instead of writing memo and columnar reports, Japanese managers tend to go and talk to each other. Now with the advent of Japanese language word processors and communications links, all that is due to change drastically.

But, I ask, before we start

screaming in our shoes, does not wonder whether this will benefit the Japanese from making them more efficient by indicating all the problems we have, namely bureaucracy, red tape and Parkinsonism. After all, efficiency at these stems from the fact that documents are not buried under mountains of paper!

I know Socrates would have objected to the human writing on the grounds that it would cause the human mind to atrophy. I've never held that view, but I shall be writing eagerly to see what Japanese productivity will bring in screens on tiny

keyboards. Another has become a trainee systems analyst, and another has gone to Belfast College of Technology to study computer science. One other has gone to the Spastics Society self-help scheme at Milton Keynes. Apart from one who returned to an existing employer, the others are all unemployed.

The scheme provides TOPS training in Cobol using MSC funding and teachers provided by ICL (CW, November 15 1979). The problems of the disabled trainees reflect the difficulty that all experienced TOPS graduates nationwide have been having in finding jobs to start out in the industry.

Only one of the first 14 disabled

trainees had found a job as a programmer, after 130 applications. Another has become a trainee systems analyst, and another has gone to Belfast College of Technology to study computer science. One other has gone to the Spastics Society self-help scheme at Milton Keynes. Apart from one who returned to an existing employer, the others are all unemployed.

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In a bid to speed the training of keyboard operators and typists, a new firm has been floated to design and market a teaching pack which is based on Musick 6502 8-bit chips.

In operation the system displays the blank keyboard with the home keys marked. If a mistake is made, the keyboard is "frozen" and the word "Error" flashed on the screen.

"Trainee performance is continuously monitored and a record stored for use by the training supervisor at the completion of a session," said Petritz.

A trainee can proceed to the next exercise until the last one has been accurately completed. Petritz said: "Keyskills is designed to teach both novice and experienced operators."

The system costs £1,500 and can also be hired. It can be adapted for schools, colleges and all branches of industry and commerce.

Firm set up to sell teaching kit



IN a bid to speed the training of keyboard operators and typists, a new firm has been floated to design and market a teaching pack which is based on Musick 6502 8-bit chips.

In operation the system displays the blank keyboard with the home keys marked. If a mistake is made, the keyboard is "frozen" and the word "Error" flashed on the screen.

"Trainee performance is continuously monitored and a record stored for use by the training supervisor at the completion of a session," said Petritz.

A trainee can proceed to the next exercise until the last one has been accurately completed. Petritz said: "Keyskills is designed to teach both novice and experienced operators."

The system costs £1,500 and can also be hired. It can be adapted for schools, colleges and all branches of industry and commerce.

Interactive APL service

THE APL products house APL+Plus now includes Fortran, Cobol, PL/I, Basic, Assembler, MPSX, SCSS and Easytrieve. It also provides application packages for financial planning, manufacturing and materials management and database management.

The range of software products

GILB'S MYTHODOLOGY

There is always a simpler way . . .

THIS is one of the simplification principles from the list of 12 principles I listed in a previous Mythology (CW, September 11).

You can use this principle if you are a designer, by deciding that you will not give up until you have found at least one of the simpler ways. Often begin along the simplification path by having a gut reaction that "there must be a simpler way". Then, picking up on the article of faith that "there is always a simpler way", I proceed to find one.

The may sound like a childish game. But it works! If you don't even think the thought consciously, that there must be a simpler way, then you are likely to get so wrapped in the complexities of implementing your overcomplex solution, that you will never have time to sit back and find the grand simplification.

There will always be a crowd of people around you insisting that there is no simpler way, that it must be solved this way:

• because the big boss decreed it;
• because IBM doesn't have an Apple II type system;
• because you can't do it any other



FOCUS

Power goes to the highest bidder

the local independent manager organisations.

PROFIT from the US that computer hardware is to be sold at a public auction. Whether the auction gets a slump in sales through too many channels or a shortage of available gear is unclear, but the event certainly portends interesting developments.

The organisation behind the entrepreneur, Sotheby's, is probably more noted for handling precious fine arts, plus much of the British Heritage, than for handling data and computers. The company suggests that, if successful, it tends to run similar auctions on a quarterly basis throughout the UK.

A quick check reveals that Sotheby's currently operates a series of Burroughs computers in London. Whether these particular machines are earmarked for early disposal to the highest bidder hasn't as yet been revealed. Perhaps Sotheby's have it in mind to dispense with its total DP system, in which case members of the PDP team could well find themselves coming under the hammer as part of lot B3709. Description tags would no doubt state: "Microprocessor, decorative early 1970s unit, possibly defective, early 1970s unit, with tear, see good for further reference".

The simple solution was there, but not many of them were willing to risk the wrath of their peers to make it work. The big boss, however, had a bigger boss (the Minister of Finance) and wanted to get the job done. He understood the simplification, and pushed it through.

Gilb's hypothesis: There is always a way, but most people refuse even to look for it - and when it is found for them, they will split on it.

The book, Techniques of program and system maintenance (edited by G. Parkes), reviewed in my column (CW, August 28), is available from GST Computer Systems Ltd, 91 High Street, Longstanton, Cambridge CB4 3BS, tel: (0954) 8191. The UK price is £15, plus £1 post and packing (post free for 100 or more copies). GST Computer Systems Ltd is authorised European distributor for Edntronics products.

"But," said my chief programmer, "it won't work."

"Why not?" I replied.

"Because one half of all our logic

is character-string handling in complex variable length records.

Cobol handles this easily, but the conversion from our present four-character-per-word to the new 10-character-per-word machine would be an impossible task in Fortran. Technical note: just think of all those DO loops geared to four character-per-word and the corresponding equivalence statements. The conversion package does not handle strings at all," he concluded, emphatically.

The technically competent reader will recognise that there is a simplification here. Burroughs claimed for the early establishment of regular computer centres in its sales offices.

Well, was the East German Obersteuerungsamt (Obersteuerungsamt) which was later established at Berlin-Tiergarten, a technical

centre and British

centres.

And show for the first time in the

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It's investment now or fewer jobs, says Tim

THE message that ASTMS union leader Tim Webb has just sent out to his members is more than just another educated essay on the computer industry. For the first time, computer professionals are being told to look to their laurels.

For the past 10 years, they have been chased after, poached and made to think, by the media as much as by rapid change within their own industry, that the work they were doing was the work of the future, that the only way was up and, while industry after industry was falling into trouble, nothing could halt the acceleration of an industry on which all aspects of future society would be based.

Tim has told these people, and hopefully the government, that this is not necessarily so.

The message behind his pamphlet "Computer Professionals: Image and Reality" is that although there will no doubt be computers everywhere in the future, there is no reason to think that these will be UK machines.

Quite the opposite.

All the signs point to the fact that unless more money is ploughed into the UK DP industry now, there will be no such future for UK DP staff. The Japanese and the Americans have already got a firm foothold in the UK, and we have only 5% of the world market.

Deficit

The UK started off as an innovator in the field of computing, but the industry now contributes a net deficit to the UK economy, amounting to £200 million in 1979. There will not be sufficient

openings in foreign manufacturing and sales offices in the UK to accommodate the vast number of computer staff now working in this country.

And yet the cry is "more staff, more training" - what is going to become of these people if the industry, as Tim predicts "crumbles beneath our feet"?

Cocooned

Tim's warning and his recommendations are one matter. The other issue that his pamphlet raises is how have computer staff come to be cocooned in this "unique" state of self-importance?

His message can be roughly interpreted as: if you've got a job now in DP, you'll probably be OK; but don't encourage your children to get involved with it as well.

Who exactly can solve this almost inevitable landslide of the UK computer industry? Tim looks to the government and to the unions to play their part.

The government, he says, must be prepared to make confident investments in the business and also be more liberal with grants for areas where manufacturing branches of industry can be successfully housed.

Many of them are interested in writing programs, or designing systems and, apart from the people at the top, they never associate themselves with the industry, only with the job.

This arises because the compu-

The cry is "more staff, more training" - what is going to become of these people if the industry crumbles beneath our feet?" asks ASTMS National Officer Tim Webb (right).

prompting of one white collar official.

The Microelectronics Industry Support Programme has been reduced to £35 million. This is the same amount now allocated to our foreign counterparts. Both in schools and in government re-training schemes, such as TOPS and Threshold, more money and skills should be made available.

And the unions does not just lie on the government's shoulders. In industry, too, should look further than just solving its immediate staff shortages and invest more in in-house training schemes to compensate for the ever-increasing number of redundant skills.

At this point is one who is concerned Webb particularly. It is now a fact that people are being made redundant at an early age. We are quite accustomed to the assumption that new technology is putting people out of work.

The notion that people are being made redundant who actually work with that technology, because their skills are obsolete, is an alarming one.

Although stating that there are no instant solutions for all the problems that arise in a "fast-moving profession", Webb lists in his general conclusions that the government should require foreign multinationals to comply with the provisions of the OFC guidelines on the provision of training information, particularly train-

ing and net import and export figures.

Education, too, for young and old, is something much overlooked in this country compared to our foreign counterparts. Both in schools and in government re-training schemes, such as TOPS and Threshold, more money and skills should be made available.

In the related words of communications official Michael of Employees it is shown that only 10% of professionally qualified software engineers.

The most obvious pointer towards Government awareness of the situation is the delay over In-

ternet. The delay in providing Inmos with the agreed public funding does not make for confidence in the government's ability to comprehend the available opportunities", writes Webb.

He points to the fact that he concerns Webb particularly. It is now a fact that people are being made redundant at an early age. We are quite accustomed to the assumption that new technology is putting people out of work.

The notion that people are being made redundant who actually work with that technology, because their skills are obsolete, is an alarming one.

Women
have
nearly
made it

THE ASTMS computer Professionals: Image and Reality" besides being a way of frightening the population it provides some rather bad news.

Like all good unionists,

the situation of women

is as a case in point.

"There is little inci-

"For encouraging the industry to recruit female graduates will stimulate those who have been by the higher education into obtaining arts degrees than the traditional mechanical engineering and science

in the related words of communications official Michael of Employees it is shown that only 10% of professionally qualified software engineers," it continued.

Success

Come on, ASTMS! In the "related area of education" which may educate more handful of women, one field where many will succeed.

The industry is rushing just about the next female graduates wanting them in her general.

The language follows a similar format to its mainframe "big brothers". A one-off query to list all females and their phone numbers under 35 in department 43 would be phrased as follows:

LIST NAME, PHONE FOR SEX = FEMALE, DEPT = 43 AND AGE LT 35 THRU DEPTS, EMPLOYEES.

Although not entirely free format, the design of the query language requires very few tricks to

get the job done.

Another announcement from

MDBS, QRS, follows the trend set

by mainframes towards ad hoc

queries phrased in non-procedural

English phrases. It works with the

hierarchical version, HDBS, as

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OP SPOT

Laser printers can help ops cut out boring work

If Caxton were alive today and if he'd retained his revolutionary turn of mind he might well have asked why anybody would give IBM a quarter of a million pounds for a great white wardrobe of a printer.

The IBM salesman would be quick to explain that the 3800 laser printer is designed to keep pace with the 370.

Gaxton would probably scratch his bald pate and wonder why it is quite safe, we think we'll find more benefits as time goes on." He's impressed by the machine's ability to cope with its own donkey work for it cuts out the time-consuming aspects of bursting and trimming.

From the company's point of view the 3800 is being used in support of Key Markets' transition to the point of sale equipment which will eventually be installed in all its 112 stores. The first store to use PoS was at Spalding in October 1979; the next to make the switch is at Penpe.

Key Markets is going to the trouble and expense of installing PoS systems for very good reasons.

Analysis

Firstly it slims down stock control work by providing a swift analysis of sales information.

Thus the vital balance between beans and tomatoes can be established, as can their position in the fact that IBM has sold 730 of the

things in the US and a further 50 in the UK.

One of IBM's recent 3800 customers is supermarket chain Key Markets. Delivery was taken at the computer centre in Hainault, Essex on September 3 and the engineers had it running within a week. Operations supervisor Steve Potter was one who welcomed its arrival.

"From an operational side it is quite safe, we think we'll find more benefits as time goes on." He's impressed by the machine's ability to cope with its own donkey work for it cuts out the time-consuming aspects of bursting and trimming.

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Tortuous

Firstly it slims down stock control work by providing a swift analysis of sales information.

IBM had claimed that users putting sticky labels through the 3800 would end up with a sticky argu-

ment in the machine's innards. The bureau which used to handle Key Markets' laser printing work had refused to contemplate the printing of the shelf edge stickers.

As well as being slow by comparison with the speed of processing, printing has always thrown up fundamental nuts and bolts problems for the engineer to cope with. The US National Printing Converters Inc., which provided Key Markets with the labels, spent nearly £100,000 on research.

Having sorted this out the designers had to find a glue which wouldn't react to the 350° temperature which is required to fix the print.

One of the tasks assigned to the 3800 is the production of these sticky labels. It can print 9,000 in six minutes and, inflation being what it is, 1,000 changes have to be made every week.

IBM had claimed that users putting sticky labels through the 3800 would end up with a sticky argument.

Having sorted this out the designers had to find a glue which wouldn't react to the 350° temperature which is required to fix the print.

Forty different adhesives were sampled before the right oil based substance was concocted. Paper and performances had to withstand the acceleration of the 3800 cranking itself up to top speed.

Bob Buckley, president of National Printing Converters, says "These sticky labels will be beneficial to three parties. Myself, the end user and IBM."

He needs IBM's good housekeeping seal of approval although the multi-national always makes its claims on the side of safety. He has already got several

Completed packages of software: general concepts of computers, pieces of a computer, use Aset, how to use an operator, how to use a console keyboard, file loading procedures, introduction to JCL, TBL, key input, cursor scheduling, and an introduction to the operators.

By all accounts Baker is a hard task master given to writhing new browns. On arriving at Key Markets he put a stop to clashes between ops and programmers and changed from a two shift to a three shift system.

Then, should the proposed bureau service prove successful, there will be more ops jobs. The next change is to be an upgrade from the present 370/135 to a 4 megabyte 4300. This will entail moving from DOS/Power VMS to DOS/VSE with the possibility of VM later on.

Andrew Robinson, our operator, writes: "Hello, the operator, far more of programming techniques, bonus for management, etc. has a bunch of happy, educated ops on its hands who have dropped the habit of their bags and moving on jobs."

Trevor Jamieson, our administration controller, places extra emphasis on training. The National has a Unisys supporting a real time communications network and Janesons' downtime caused by trained operators hitting the operators.

Completed packages of software: general concepts of computers, pieces of a computer, use Aset, how to use an operator, how to use a console keyboard, file loading procedures, introduction to JCL, TBL, key input, cursor scheduling, and an introduction to the operators.

The System M-Two comprises 64K of RAM expandable to 128K, and can have either Winchester fixed disc back-up or double density floppy disc, providing 10 to 20 Mbytes or 1.2 Mbytes of storage respectively. It runs the CP/M operating system, enabling a variety of high-level languages to be implemented.

Each system can run up to four VDUs, providing they are less than 1,000 feet away from the processor, and one or two printers, at 60 or 180 characters per second. LSI Computers actually provides its own Pentland Model VI VDU with the systems. A floppy disc based system with one VDU and a matrix printer is available for £7,900, while the Winchester-based system with four VDUs and the floppy disc costs less than £14,000.

LSI Computers stresses that numbers of systems are complete and available now, with a delivery time of around four weeks. The company hopes to achieve a production rate of 20 per month until Christmas, and will eventually be exporting up to 50% of its total production.

Growth trends study

DEMAND for semiconductors throughout the world is expected to reach \$47 billion by 1985, according to a study on microelectronics growth trends by Mackintosh Consultants. In 1979 the figure was \$14 billion, implying an average annual growth of 22%.

Worldwide consumption of integrated circuits is expected to undergo an average annual growth rate of 27%, from \$9 billion in 1979 to \$38 billion in 1985. However, the total growth rate is expected to drop to 17% in 1981 and increase to 23% for the following years.

According to the report, US companies will keep their 63% share of total semiconductor production, but lose some of their share of integrated circuit production with a large increase in foreign firms.

by Paul Fisher

Getting the Abbey habit



Happiness is a pile of sticky labels popping out of a laser printer. Shift leader Kevin Glover is holding the labels and behind him is ops supervisor Steve Potter.

MANY an operator has jobs out of pure boredom: management at the National Building Society in North London upon a scheme which sees holding the internal operators and is also based on the society.

"I keep thinking I'm in Spalding," said an executive looking round his Romford store. That's one of the benefits of standardisation. Shoppers moved at a brisk pace past a rank of IBM laser scanners. Each shopper was given a ticket from the till detailing items purchased, prices paid and the method of payment.

None of the goods had price tags but carried inscrutable bar codes instead. Since the introduction of laser scan checkouts there has been a legal requirement for shelf edge stickers describing products on display and the cost.

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MICRO NEWS

IBM uses gate array technology in VLSI

GATE array technology has captured the interest of IBM in one of its advanced technology projects in VLSI. It has implemented the logic part of the System 370 model 138 computer with a 5,000 circuit bipolar gate array chip.

IBM claims that the Schottky-clamped TTL chip, if used in a system, should be capable of a sustained performance rating of 2,000 instructions per second when executing IBM 370 instructions.

The chip is specified by IBM as having a power dissipation of 2.3W and an actual measured speed of 2.2 nanoseconds for a machine cycle time of 100 nanoseconds. It contains 7,640 internal cells, 64% of which are occupied by circuits.

Claud Davis, manager for advanced system design and evaluation, told the first International Conference on Circuits and Computers in New York, where the announcement was made, that the chip was not developed with a specific IBM system in mind. However, the information gained for the project could be used in the development of future products.

Experience

The semiconductor process used in the development of the IBM 370/138 array device was the same as the one used for bipolar random logic chips contained in the IBM 4300 series of computers. It features a two micron thick epitaxial layer, recessed oxide isolation and three levels of metal.

IBM's experience in the design of gate arrays goes back 10 years to the layout of 130-circuit bipolar chips. Since then the company has used 700-circuit logic chips in the System 38 and 4300 Series and a 1,500-circuit bipolar gate array in microcontroller applications.

The System 370 project involved the IBM automated design systems and it took only nine months for the sequence of logic entry, auto-placement, auto-wire routing and test pattern generation, ROM, RAM and registers needed for a complete 370 were not included on the array device.

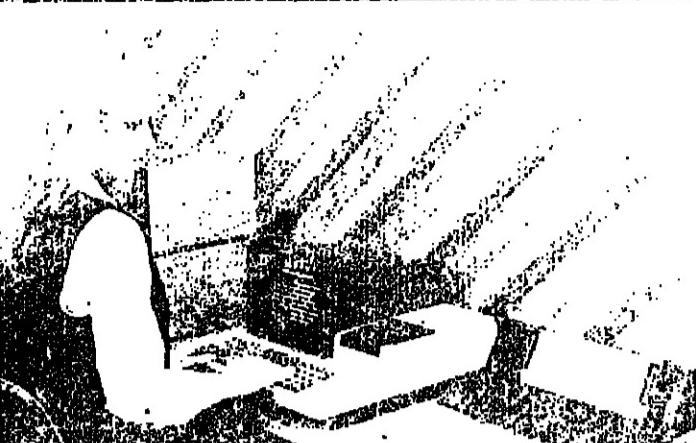
The conference brought to light

the fact that several semiconductor companies are dedicating resources to the development of gate arrays, and most computer manufacturers are following the developments.

Fairchild is working on a 2,000-circuit gate array for introduction late next year. The company foresees a dramatic increase in the use of gate arrays within the next three years. Those on the market will be based on sub-micron-sized ECL, Schottky and low-power Schottky TTL, integrated injection logic and CMOS.

Dr Tom Longo, chief technical officer for Fairchild, is of the opinion that anyone serving the computer industry must offer gate arrays. He considers that the current simple gate arrays will be followed by arrays which include registers and PLAs.

Both Longo and Leslie Vudasz, senior vice-president of Intel, are of the opinion that gate array architecture complements the microprocessor in system level products.



The CP/M operating system is now available for the Sharp MZ-80K microcomputer, seen above. Developed by Torquay-based Crystal Electronics, the Crystal CP/M 2.2 can be bought from all Sharp dealers for around £200, excluding VAT.

Faster switch method

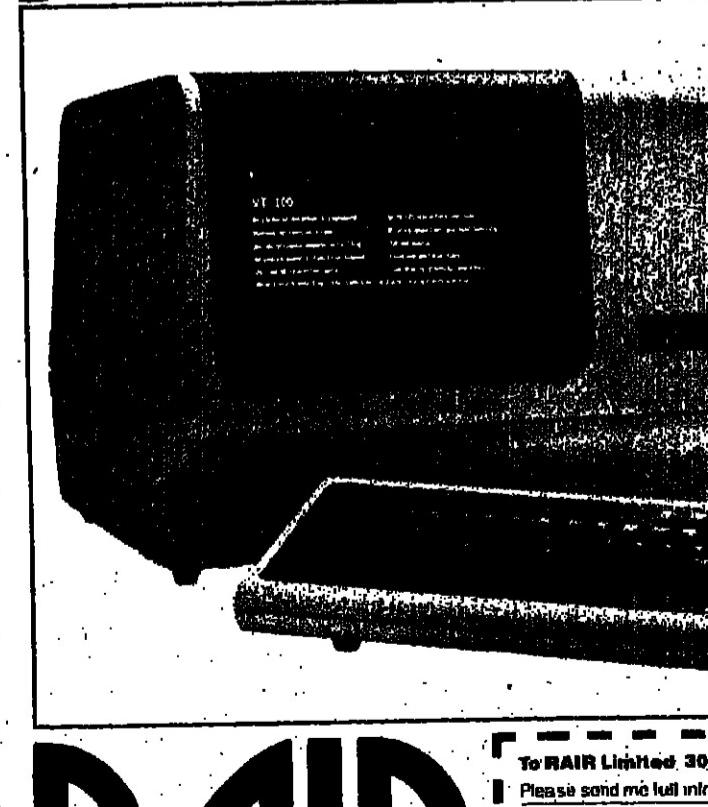
AN experimental transistor microstructure that will switch in 0.3 nanoseconds has been developed by IBM. It uses a merged transistor logic (MTL) technology which is IBM's version of integrated injection logic (I²L), and Dr Tom Longo, chief technical officer for Fairchild, is of the opinion that anyone serving the computer industry must offer gate arrays. He considers that the current simple gate arrays will be followed by arrays which include registers and PLAs.

predicting a pattern of low resistance which could allow current circulation without an increase in electrical charge, and thus not limit the speed of the circuit.

An auto-alignment process of the new structure enables dimensions of the circuit to be reduced and this results in an increase in speed.

IBM's method consists of

AVAILABLE AT LAST Ex stock VT100s plus full range of options



Special price
£999

80/132 Column VDU with detachable keyboard, smooth scrolling, split-screen, and video input/output.

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PEOPLE and EVENTS

Plessey director is named IEE president

THE INSTITUTION of Electrical Engineers has named its president and chairman for 1980/81.

President is Air Marshal Sir Herbert Durkin, who has been a member of the IEE council since 1974. He was elected vice-president in 1977 and deputy president in 1978.

Sir Herbert read mathematics at Cambridge before being commissioned into the technical branch of the RAF in 1941. He served in India, Iraq and Germany before being appointed director of engineering (policy) at the

Management competition

ENTRIES are now being accepted for the 1981 National Management Game, sponsored by the Financial Times, the Institute of Chartered Accountants in England and Wales and ICI, in association with the Institute of Directors and the Confederation of British Industry.

The game puts teams of competitors into a boardroom situation where they work together to make decisions within a time limit. The first prize is £2,000.

The entry fee is £65 + VAT, and closing date for entry is November 7. For further information write to the Administrator, National Management Game, ICI, Beaumont, Old Windsor, Windsor, Berkshire, SL4 2JB.

Kathy Martin has joined Marcom Computer Services as personnel manager. She was previously with Data Logic and is a qualified associate of the Institute of Personnel Management.

Peter Warr has been appointed general marketing and sales manager for Transitel Communications. He joins from Pye-TMC.

Elliot Wasserman has been appointed vice-president, marketing, for North Star Computers Inc. His previous experience includes positions as director of international operations at the Monroe division of Litton Industries and director of international market planning and development for Wang Laboratories.



Ministry of Defence on his promotion to Air Commodore in 1967. In 1973 he was appointed director general of engineering and supply management at the MoD, and in 1976 became controller of engineering and supply (RAF) in the rank of Air Marshal. He was awarded the KBE at the 1976 birthday honours list, and retired from the RAF in 1978.

Sir Herbert read mathematics at Cambridge before being commissioned into the technical branch of the RAF in 1941. He served in India, Iraq and Germany before being appointed director of engineering (policy) at the

Deputy presidents of the IEE are Sir Francis Tombs of the Electricity Council and J. Banks of BICC. Chairman of the computing and Control Division is R.W. Sutton of GEC Hirst Research Centre. Chairman of the Electronics Division is F.H. Steele of Sony Broadcast and chairman of the Science, Education and Technology Division is R.C. Hills of the IBA.

Visiting prof

PROFESSOR Reginald Wood of the University of Alberta, Edmonton, Canada, has taken up a sabbatical appointment with the Computer Aided Design Centre in Cambridge as a visiting research fellow.

Prof Wood has been a member of the Department of Chemical Engineering at Edmonton since 1966, and spent a previous sabbatical leave, between 1972 and 1973, with the Control Engineering Group at the Warren Spring Laboratory in Stevenage.

During his twelve-month stay Prof Wood will be working with the centre's Process Industries Group, where he will be contributing to the development of new programs for the simulation of chemical processes.

W.G. Halbert has left ICL to become managing director of CSC Holdings subsidiary, Microcosmic Systems.

John Hardy has joined Computer Machinery Company as territory manager for Middlesex and West London. He was previously with Harris.

Wilson Haddow is customer accounts supervisor at CMG Computer Management Group (Scotland). He has worked in the computer field for six years, having held posts with British Steel Corp and Weir Group management Systems.

It wasn't fixed — honestly!

COMPUTER Weekly won the first Computer Summer League Knockout Cup 5 August Venteck, and it wasn't a fix, honestly. Neither was it an easy victory. Trouble was the name of the game in the first half. Within five minutes of the start of the game, played at Clapton FC grounds in Plaistow, East London, a Venteck player collided with his own goalkeeper and had to leave the field nursing a broken arm.

If you're thinking that things could only have gone better from them, you're wrong. Soccer is notorious for

Bob Laughland has been appointed export marketing manager for Hammer Europe. He has been with the company for 21 years, most recently general manager/director of Cutler-Hammer, in Singapore.

Videc, an affiliate of Easiformation Systems, has appointed Harry Ross as general manager Europe. He was national sales manager for Videc Inc. in the US, prior to new appointment.

Tucker joined Motorola after graduating from Arizona State University, where he gained a Bachelor of Science degree in electrical engineering. In his new post as general manager, he will be responsible for all the company's marketing activities outside of the US.

Eddie Syms, chairman of GEC Segar, has been elected chairman of the Electrical Installation Engineers Manufacturers Association (EIE).

Kieron Kelly has joined Microsystem Services as manager of the newly formed Test Systems and a director of the company. He was formerly with Labtex.

Walter Davis has been appointed director of international marketing at Bunker Ramo Corp's Information Systems Division in Greenwich, Connecticut. He was formerly with Brokertech Systems.

Philip Cole has joined Prime Computers as sales executive. He was formerly with Computer Services Group. Another sales executive, Steve Child, has been recruited by Prime. Child joins from ICL. Prime has also created two new senior management appointments. Rex Blagg has been promoted to manager, office systems, for Northern Europe, and Claudio Vass has become field engineering manager for the Northern European region.

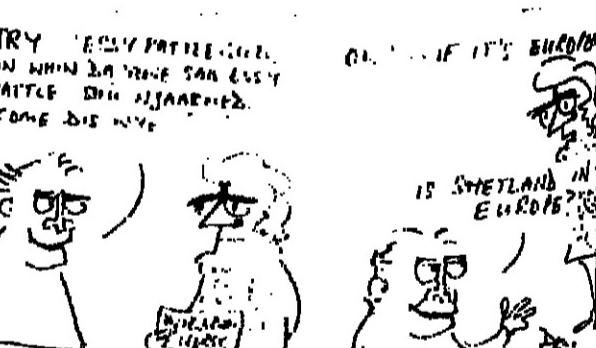
Robert Buxton has joined MAI UK as sales executive, based in Bristol. He joins the company from Data Retail, where he was area manager for the Midlands.

John Mathews, for the past two years general manager of Wilkes Business Forms, has been appointed to the main board of the holding company, James Wilkes Ltd.

Wilson Haddow is customer accounts supervisor at CMG Computer Management Group (Scotland). He has worked in the computer field for six years, having held posts with British Steel Corp and Weir Group management Systems.

Ellisair Crawford has been appointed product promotions specialist at Rediffon Computers. He was previously territory manager for the South East branch of the company.

by DM



TRY 'EASY-PATTE-EE',
AN WHEN DA VINE SAN EASY
PATTE SIN MAAKED.
COME DIS NOV.

OR... IF IT'S EUROPEAN,
IS SHETLAND IN EUROPE?

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Douglas Moore, Computer Editor of The Sunday Times, IFIP

We must consult shop floor, says Governor

"UNDERLYING much contemporary writing on computer technology is a stress on the importance of consultation with those affected," particularly in the workplace," the Governor-general of Australia, Sir Zelman Cowen, told delegates when he opened the Eighth IFIP World Computer Congress at Melbourne.

Indicating a problem common to many countries, he warned that Australia was becoming totally dependent on imports for the supply of its information technology.

This raised the question of policy, on which, as Governor-general, he did not wish to speak.

"I point only to the problems which this generates for a society dependent in many vital and sensitive areas on operating computers," Sir Zelman said.

"What if sources of supply are threatened in an international crisis?" he asked.

Vulnerable

He mentioned a Swedish government report which examined aspects of society's vulnerability.

Capture the computer, says the Swedish report, and you capture the society which depends on them.

Societies were also vulnerable to acts of terrorism against computers and to the risk of disasters and accidents that could dislocate sensitive computers, Sir Zelman pointed out.

Distrust

"As society becomes increasingly dependent on computers, these concerns assume increasing importance," he said.

He also referred to the threats to individual privacy posed by computer databanks.

Problem

Quoting Mr Justice Kirby of the Australian Law Reform Commission, Sir Zelman said modern privacy was the business of asserting and upholding the individual's rights in respect of personal data about himself.

"Privacy invasion today is a



IFIP MELBOURNE

disputes: the printing industry is one example."

Competitive

Also at the opening was Ted Wastie, president of the Australian computer society, who said countries like Australia must computerise their manufacturing industries in order to stay competitive.

But Wastie stressed, it must be realised that computing is a service industry. "Computers must be introduced at a rate which the general public finds acceptable," he said.

30 chips APL terminal

THE APL character set has been added to the £699 AJ880 30 chips impact matrix printer announced earlier this year by Anderson Jacobson. With APL, the printer costs £899, or £49 a month rental, and is claimed to be the only APL printer for under £1,000.

The AJ880 has a seven-wide print head and print spacing is user selectable from 10 to 16.5 characters per inch and from two to 12 lines per inch. It has a 700-character buffer and can communicate at up to 9,600 bps.

Hartley leads local hardware export drive with its 3900 series

PROMINENT at IFIP in Melbourne was the stand of Brisbane-based Hartley Computer Applications, which introduced its Australian manufactured 3900 hardware series (CW, October 9).

Hartley is now expected to be the first Australian hardware manufacturer to export complete systems in significant quantities. Formerly, it added its software to US hardware from DEC, Wang,

and Data General.

Its Hapas software for professional accountants and Practices software for the medical profession will now be offered with its own hardware. But initially its Shell Small Business System will still be based on Data General hardware.

The three 3900 models make extensive use of Intel 8086 16-bit microprocessors. With built-in 200 megabyte discs from Storage

Bid to get more jobs for disabled in Australia

IN A bid to get more disabled people jobs in Australia, the National Association for Training the Disabled in Office Work (NADOW) has developed a scheme that concentrates on skills in computer operations, programming and data entry. IFIP was told.

In a paper, "A computer training scheme for the disabled," prepared for the IFIP congress in Melbourne, Sheila Blackmore, NADOW founder, describes the NADOW computer training scheme.

She hoped that similar schemes could be set up in other countries to train the disabled in computer skills, but said her association was concerned with people who had no mental problem.

Challenge

As such their real challenge was just like anyone else's. Thus they did not want to sit at home doing nothing when they could pursue a worthwhile, interesting and challenging career. They did not want to live on government pensions and they do want to enjoy some of the better things in life that money can provide, Blackmore added.

Studies had shown that in Australia over one million people suffer from chronic limiting illnesses, injuries and impairments. NADOW is a voluntary association formed in 1965 by interested business people who recognised the need to provide an assessment and on-the-job training facility in

which physically handicapped people could gain experience.

Now, 15 years later, disabled people have graduated from NADOW training programmes.

Background

It was against the NADOW office training background that computer training scheme started in 1973.

"Irrespective of whether disabled people are ideal for training in some brands of processing, it is mandatory they undergo a 13 week course in our commercial computer," Blackmore said.

She told delegates that it is vital that, as computer professionals, they understand how and if possible helped the disabled people in their own countries.

"We should all remember we have thousands of vacant computer positions for which there are no qualified staff. Very highly trained and totally qualified handicapped people have immediate and ideal solutions to people shortage."

"Of the high proportion completed the course, 68% placed in the office and craft fields. Many of the people who have been trained would otherwise be in receipt of pensioner assistance and a burden to the community," she concluded.

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COMPANY NEWS

US starts to get over depression

A CLUTCH of third quarter results from major DP firms in the US show a markedly different outcome to trading through what President Carter called the bottom of the depression over there.

Higher sales at IBM and, to a lesser extent, at NCR gave them both increased earnings, but component shortages choked off Burroughs' production and caused a sharp drop in profits for the quarter.

In fact, Burroughs is going through its worst patch for 17 years and, as reported briefly last week, year-on-year profits were down for the second quarter running. The company does not hold out much hope of an improvement in the fourth quarter.

Net profit slumped 32% to \$42.2 million on turnover up 4% at \$699.3 million. The main reason for the slide in profits and meagre growth in turnover has been problems in meeting demand for new products, led by component shortages.

To make matters worse, a strong order position began to soften in the third quarter, and the prognosis is that profits will be down 20% for 1980 as a whole.

32% rise

Meanwhile IBM's third quarter results rose by the same 32%. The company announced net profits up that amount at \$883.9 million on turnover up 20% at \$6,480 million. The rise was the best in a quarter from IBM since 1974 –

but it is compared with a poor third quarter in 1979.

Main reason for the surge was a favourable change in the outright sales to rentals and services ratio – and IBM has been manipulating its prices to achieve just that.

Sales were up 25% to \$2,590 million, whereas rentals and services rose only 17% to \$3,890 million. While sales moved ahead 6% over the second quarter, rentals and services rose only 4%.

Currency gains helped to swell its profits, contributing \$17 million, compared with \$5 million in

the same quarter in 1979.

Since IBM's fourth quarter last year was better than the third, the improvement in the current period is not expected to be so strong. For the first nine months of 1980, profits were 16% up.

Finally, NCR has put its component shortage problems behind it in the third quarter, and has reported profits up 15% at \$54.5 million on turnover up 12% at \$792.3 million.

While orders are falling in the US market, they are increasing slowly in the rest of the world.

Finance subsidiary boosts Control Data's profits

CONTROL Data Corp has been very successful in recent years in ironing out the ups and troughs of its business as a result of having a financial services company, Commercial Credit, which often does well when the computer side is off-colour – and vice-versa.

The company saw net profits up 6% at \$40.2 million on turnover up 16.5% at \$938 million.

Most of the improvement came from Commercial Credit; on the computer side, it managed a 2% increase to \$24.6 million in profit on turnover up 23% at \$687.9 million.

The figures are distorted by extraordinary gains – offsets against tax from previous years, which amounted to \$2.2 million in the third quarter of last year, and

only \$600,000 in the period just ended.

Profits at Commercial Credit rose 14% to \$15.6 million on turnover almost static at \$240 million.

Reason for the excess apart from the fact that the branch of the high technology is Number One in the market at the moment – is meteoric growth.

From a turnover of \$72 million two years ago, it is expected to hit \$150 million this year.

The firm has resisted

temptation to repeat Paul Allen's gang of the 1960s by taking over Apple Computer Inc.

Veteran Wall Street observers

worried that demand for their

shares will only get 0.72 of a share and will have to wait for the remaining 0.13.

The value of the ex-cow account will be about \$8 million.

This is going into an ex-cow account to cover liability incurred by Documentation which have only just been uncovered. They relate to three legal actions against Documentation. Two are actions alleging violation of securities legislation and the third is an action of the court.

It will still pay an overall 0.85% storage fee

share for each Documentation one, but holders of the latter's shares will only get 0.72 of a share and will have to wait for the remaining 0.13.

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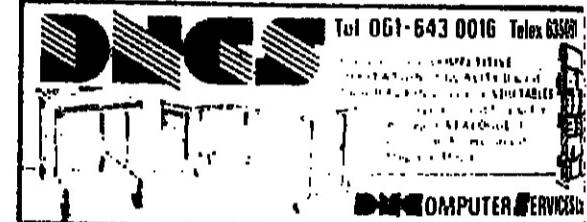
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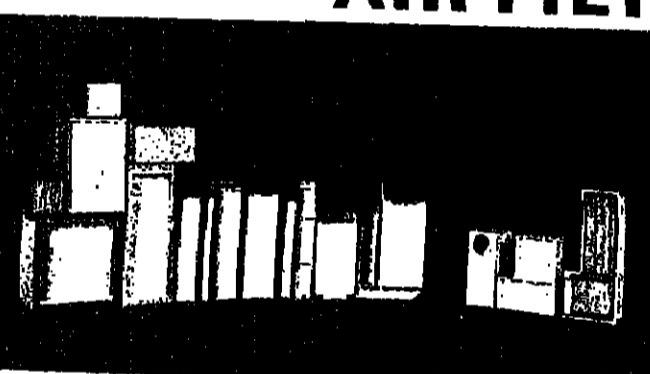
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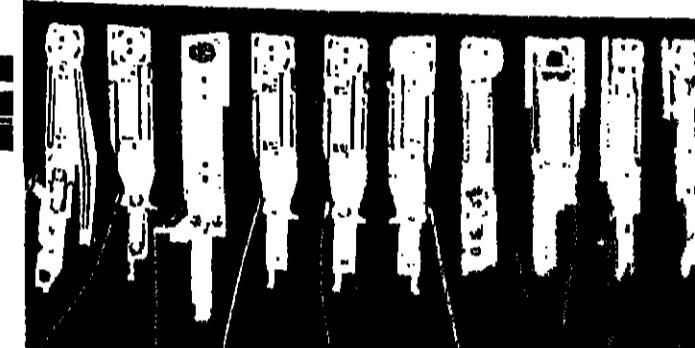
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A typical system environment for the operator would be the quoted salaries, annual leave, 25 days, plus寒暑假期, include modern premises, facilities for welfare and excellent recruitment facilities for the operator.

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Candidates should have previous computer experience preferably in a medium-to-large George installation.

* Includes shift allowance

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Programmers COBOL**£ negotiable-upwards of £10,000 net of tax + substantial benefits****BAHRAIN**

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telephoning Portsmouth 27881, ext. 311 and returned by 7th November, 1980.
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IRISH DAIRY BOARD - DUBLIN DATA PROCESSING SPECIALISTS

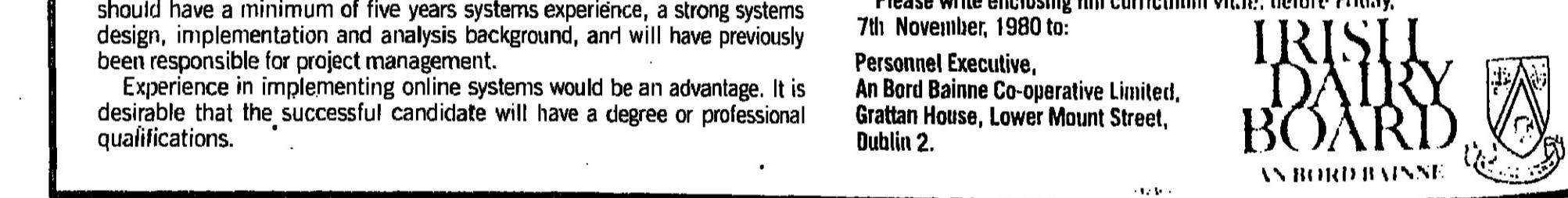
The Irish Dairy Board is undertaking a major online/real time programme to ensure that its systems are geared to meet the rapidly changing requirements of the national dairy export organisation. The Board plans to install in the immediate future, an IBM 4341 computer operating under VM/370 and OS/VSI. Extensive use will be made of CMS and CICS. Vacancies now exist for the following positions at our Head Office in Dublin:

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To develop and co-ordinate a variety of projects. He/she will consult with all levels of management, evaluate user requirements and ensure that projects are implemented to the user's satisfaction.

The successful candidate, reporting to the Data Processing Manager, should have a minimum of five years systems experience, a strong systems design, implementation and analysis background, and will have previously been responsible for project management.

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We are looking for a limited number of Senior Programmers, Analyst Programmers and Software Specialists to join our teams working on IBM 370, 4300 and 303X as well as Burroughs and DEC systems.

Ideally we seek relevant experience, but we are happy to discuss career and training prospects with experienced computer staff, no matter what your background.

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Four-Phase Systems
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WE'RE MOVING

NOTICE TO CLASSIFIED ADVERTISERS RE: CHANGE OF ADDRESS

With effect from November 7, 1980, COMPUTER WEEKLY will be moving to Sutton, Surrey. From this date, classified advertisers should send their material to the following address:

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COMPUTER OPPORTUNITIES IN SCOTLAND

Quality and quantity abound north of the Border . . .

THE current world and British recession is no less a worry to those involved at all levels in the DP profession than to anyone generally concerned with business and commerce or even the hard-pressed housewife. However, if we all took a negative and fatalistic attitude we might as well stop the world now and apply to become a Black Hole instead.

The computer industry has grown so much over the last quarter-century because it has, and still is, proving its value. Therefore, although the shop floor being hit so badly at the moment, DP staff have been in a relatively secure position. Certainly some areas have been so badly affected that entire plants and businesses have closed but generally speaking DP departments are at least maintaining their staffing levels. Indeed, it is to their cost-effective computer departments that management teams must look to work towards turning the corner to renewed prosperity.

DP managers themselves are all too aware of this, but constantly frustrated by the lack of funds available or policy blocks on using the best methods available to find qualified staff.

The future in Scotland is not grim, writes DAVID HICKS, of DML Services, Edinburgh. The quality of life, increasingly important to most people, should attract not just expatriates to posts north of the Border: Scotland has much to offer in terms of housing, environment and — not least — opportunities for those in DP not overly concerned with job titles.

Attractions

The quality of life is becoming increasingly important, therefore more people, not just expatriates, should be looking at the great attractions offered north of the Border: wherever you live in Scotland you can be close to beautiful countryside; there are ample and widespread sporting opportunities; the people are friendly; housing is reasonably priced and companies realistic about help with relocation.

Scotland has held the reputation of offering lower salaries, a situation accepted by

by David Hicks

The future in Scotland is not grim, writes DAVID HICKS, of DML Services, Edinburgh. The quality of life, increasingly important to most people, should attract not just expatriates to posts north of the Border: Scotland has much to offer in terms of housing, environment and — not least — opportunities for those in DP not overly concerned with job titles.

expatriates wanting to return home. Recently the gap has narrowed, though there still exists a time lapse before realisation dawns that the gap has widened once again.

Here is where the services of a good consultancy could be better utilised. Personally I believe that a DP agency or consultancy exists and operates for more reasons than make money. Involvement and dependence upon a high technology profession means that we have a duty to fully understand that technology, to offer advice based on knowledge accumulated and to operate in a highly pro-

fessional manner. This should include an absolute degree of confidentiality and a commitment to interview candidates before forwarding their details.

Trust

Agencies have two major commitments: towards clients and towards candidates. To fulfil a totally cost-effective function the consultant must be greatly trusted by a particular client, so that applicants forwarded are technically suitable, committed to moving and will reasonably fit into the atmosphere of the installation. Thus, although a client is obviously spending money, it should be felt that it is money well spent.

Similarly, applicants should be able to trust their consultancy. The initial interview has therefore to be totally thorough so that the client's time, the candidate's time and even that of the consultancy is not wasted. The candidate should know that he has agreed to his details being sent to each particular installation and be thoroughly informed as to the function of that installation and its DP department. This modus operandi obviously means a far

more professional approach to the "sandwich course" concept to be extended and a greater degree of commercial applications to be introduced to the university courses.

Expertise

At the opposite end there are many senior candidates also waiting for suitable positions, though yet again there are few openings for them. There are exceptions to this, in that a handful of companies are now offering senior salaries with responsibilities to candidates who are not over-perturbed about job titles.

In the middle of sandwich are the people one to five years' experience whose expertise is greatest. As for the job situation in Scotland, the position remains to a great extent unchanged: there are still vacancies for experienced staff. Masses of trainees are waiting to obtain their first appointment, many of them under the false impression that they are already experienced. There is certainly room for the "sandwich course" concept to be extended and a technical candidate is required after.

Overall, therefore, prospects in Scotland look good. There are opportunities for both commercial and technical staff with good career developments and the freedom to enjoy a wide scope of life should offer. There are some agencies that are willing to put themselves out for both client and candidate rather than make a fast buck for as little effort as possible. Such a service can form third part of a vital mix that will allow DP departments to point the way to a healthier future.

Hydro-Electric

OPPORTUNITIES IN SCOTLAND ANALYSTS & PROGRAMMERS

Due to current expansion our client, the North of Scotland Hydro-Electric Board, require a number of DP PROFESSIONALS to work in project teams on commercial applications.

The modern, pleasant installation has new twin 2960 hardware, the conversion for which a complete Database has been introduced and now on-line systems being developed.

Successful applicants will be working on a variety of interesting systems and have good promotional prospects. The service provided by our client also means an extremely secure future. In a prosperous area where housing is not as costly as you would have hoped.

SYSTEMS ANALYSTS £6,000-£9,000

Candidates should have a minimum of 18 months' commercial/business systems experience and be of degree standard or equivalent qualification.

PROGRAMMERS £6,000-£9,000

Candidates should have a minimum of 18 months practical COBOL experience and reasonable academic qualifications. Normal large company benefits include a generous relocation package.

For further details and to arrange a location interview phone David Hicks on 031-226 5969, or write enclosing a full C.V. to: DML Computer Personnel Services, 11 Charlotte Square, Edinburgh EH2 4DR. Please quote reference CP/130/E. (320)

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Opportunities exist in Scotland NOW for good quality candidates in the above categories within a wide choice of area, application and installation.

LOCATIONS: West Scotland — Glasgow — Central Scotland — Edinburgh — Borders — Tayside — Fife.

APPLICATIONS: Commercial/manufacturing programmers; technical programmers; commercial/manufacturing/business analysts; technical analysis/programmers; commercial analyst/programmers; software programmers; DP Managers; project leaders; sales/support; project manager.

BENEFITS: Our clients are installations with secure futures and offering some or all the following benefits:

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* GOOD CAREER PROSPECTS * HIGHLY COMPETITIVE SALARIES

* NON-CONTRIBUTORY PENSIONS *

For further detailed information to match your requirements and to arrange a location interview phone Iain Jennings on 031-226 5969 or write to DML Computer Personnel Services, 11 Charlotte Square, Edinburgh EH2 4DR. (320)

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£5,800 to £8,000 + Benefits
Due to impressive expansion and the planned introduction of an IBM 3033 to add to their 3031 and 8100 processor, our clients require the following staff to add to their operations department:

SHIFT SUPERVISORS

Candidates should have a minimum of five years' experience on large IBM mainframes and at least two years as a shift loader OS, MVS, JES2, CMS/VM background required.

SENIOR OPERATORS

Candidates should have large IBM mainframe experience operating under OS or MVS and be capable of progressing within the company. (For the above two positions there are also posts for applicants with slightly less experience.)

SENIOR JOB CONTROLLER (TP)

Candidates should have a sound knowledge of CICS/NCP/VTAM and be capable of progressing into network management. Good user-contact ability essential.

SENIOR JOB CONTROLLER (Non TP)

Candidates should have a good knowledge of OS/MVS JCL and CMS/TSO. The modern installation is situated in a picturesque riverside location in Perth, itself at the heart of an area high in sporting and recreational facilities. This attractive Tayside town is close to both the Highlands and major Scottish cities.

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OPPORTUNITIES IN SCOTLAND

SYSTEMS DEVELOPMENT SCOTLAND

On behalf of a number of clients in Scotland we would like to meet ambitious PROGRAMMERS and SYSTEMS ANALYSTS. The range of opportunities, all in commercial installations, is wide and the vacancies are at all levels of experience. Salaries are attractive and in the range

£6,000 to £10,000

Interested? Why not contact our resident consultant — from Webster — and arrange an informal chat.

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Recruitment Consulting Division
Central Chambers, 11 Bothwell Street, Glasgow G2 6LY
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SENIOR SYSTEMS DESIGNER

Grade B01/2 (£6850 to £7722 per annum — pay award pending)

B — INTERMEDIATE SYSTEMS DESIGNER

£6288-£7688 per annum

C — TRAINEE COMPUTER PROGRAMMER

£3004-£4240 per annum
Increase in salary scales pending

South Yorkshire Police seek a suitably qualified Systems Analyst to work with police offices engaged on the development and implementation of computer systems. Based at Police Headquarters in Sheffield the post offers a wide range of design and analysis and system design roles in connection with police operated systems, a current project being the implementation of a new information system on Data General equipment. Links with the computer staff of the South Yorkshire Constabulary and the Departmental OIC will also be required in relation to police applications on the County Council's computer installations currently an ICL 1905.

Completed application forms should be returned not later than Friday 14th November, 1980.

PLEASE STATE CLEARLY FOR WHICH POST YOU WISH TO APPLY

(328)

SENIOR ANALYST PROGRAMMER

Playtex Limited, operating from their U.K. headquarters at Port Glasgow, manufacture a wide range of branded personal and family products for the U.K. and European markets.

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The current equipment consists of an IBM System 3/16D with 128K for batch processing and a System 34 for on-line processing with local and remote terminals. Future plans include the installation of an IBM System 38 for which the database design work is underway.

Applicants should have a minimum of two years' experience using RPG-11 coupled with a knowledge of IBM System 3 and 34, preferably in a commercial environment.

Applications in writing to:

J. H. Boyle
Industrial Relations Manager
PLAYTEX LIMITED
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Port Glasgow

(327)

UNIVERSITY OF LIVERPOOL COMPUTER LABORATORY PROGRAMMER / ANALYST (LIBRARY)

To join small group concerned with the development and implementation of a computer system for the University Library, currently on a large ICL 1900 computer. Experience of administrative or commercial systems, particularly in COBOL and IDMS database, an advantage. A degree is normally required for this post.

Salary within range £650-£8248 p.a. under review.

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Application forms may be obtained from Mrs. J. R. Grant, Personnel Officer, University of Liverpool, PO Box 32, Liverpool L69 3BX. Quine Ref. RV/800/CW. (326)

Box number replies should be addressed to:

Box No.

c/o Computer Weekly
Dorset House
Stamford Street
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(328)

WE INVITE YOU TO EXAMINE YOUR REASONS FOR JOINING A WORLD LEADER IN OIL

DATA COMMUNICATIONS SPECIALIST. ABERDEEN.

Below are 14 questions to which you can answer Yes or No. A glance will tell you that this Quiz is not over-difficult or to be taken too seriously. We suggest that if you are interested in the career opportunity we set out in this page you might like to complete the Quiz and return it to us with your C.V. and in so doing, tell us a little more about yourself.

YES	NO
Do you hold a Computer Science Degree	
Have you ever worked in Telecommunications	
Do you believe you are an effective group worker	
Have you worked for more than two years in Data Processing	
Are you, in general, an optimistic person	
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Oxy appreciate that the successful candi-

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We are fast becoming the industry leader in the explosive growth market-place of communications products, particularly word processors, and for this purpose we have an established Systems Business Division in Uxbridge. Here, you will provide vital technical support to our sales force and service engineers utilising your specialist knowledge to advise and train customers in the implementation and installation of communications applications. This will involve spending the majority of your time visiting customers throughout the UK in order to assess their requirements. Additionally, you will assist in setting up relevant training schemes within Rank Xerox, primarily aimed at an increased understanding of communications. With HNC Electronics or equivalent or, alternatively, considerable data communications experience, you will have the ideal background and, following intensive product training, will enjoy unrivalled scope and prospects. Salary up to £9,000 p.a. plus car.

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So contact Sue Weddell NOW on Uxbridge 38230.

Or write to the Personnel Department, Rank Xerox (UK) Limited, Middlesex House, 4 Mercer Walk, Uxbridge, Middlesex.

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You will become fully involved in this expansion, joining our Software Support Group in Uxbridge, providing essential back up to our new range of soft loaded systems products specifically designed for the office of the future. With responsibilities incorporating the identification of customer requirements, the installation of software, and post sales liaison, the position offers both stimulation and challenge in return for your systems expertise. Your background will have a sound programming and analysis base, primarily in a commercial environment with a minimum of 3 years relevant experience. Knowledge of word processing will be an added advantage.

Salary £8,000+ p.a. plus car.

MICRO COMPUTER DEVELOPMENT

West Midlands Negotiable £10,000 + Car

An exciting career opportunity has arisen within an established mini and micro computer turnkey organisation.

The role includes the development of hardware and software for micro systems from components supplied from a highly reputable and established source. The company has detailed and accurate plans for the future of this venture and will involve the successful candidate in the setting up and progress of the organisation.

You should offer a background in mini/micro computer technology, including in-depth knowledge of DEC based hardware and software. A good technical grounding in DEC operating systems, languages, device interfaces and peripherals is required. Knowledge of commercial, graphical and technical applications would be useful. It is expected that you would have relevant academic qualifications and probably be earning a package around £10,000 to be at the level required.

Any experience in liaison with manufacturers and customers would be very valuable.

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For a strictly confidential discussion, please contact Mike Hessian. Ref. CW286.

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COMPUTER WEEKLY, October 23, 1980

COMPUTER WEEKLY, October 23, 1980

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This is not only the chance for a free pint... it's a genuine opportunity to discuss the challenging prospects for your future that have arisen within the management and data services division of this multi-million pound organisation, based in Croydon.

Currently an IBM 370 installation using COBOL and running under DOS/VSE and VM with an extensive T.P. network they are upgrading their equipment to the new 4300 range in the new year. They offer the chance to develop the database and teleprocessing techniques that most discerning data processing specialists crave.

So do yourself a favour, have a pint on us, tell us about yourself, and we'll tell you all about a rewarding career and the superb benefits that go hand in hand with these very attractive salaries.

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MANAGEMENT &
EXECUTIVE SELECTION

Suite 201/6 Albany House, 324 Regent Street, London W1R 5AA 01-637 9611

Systems Analyst
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For a major financial institution with a reputation as a leader in the field of life assurance, pensions and investment planning. Due to continued expansion, a number of significant opportunities have arisen in the Company's head office located in an attractive part of the West of England.

Systems Consultants to £12,750 + Car

To play a leading role in the definition and analysis of complex business problems and the formulation of efficient systems solutions. Ideally candidates will have had at least 5 years substantial large systems experience with a demonstrable record of successful implementation. Initiative, self-confidence and a combination of business flair and strong analytical abilities are prerequisites. Preferred age is under 35.
Ref. G861/1

Business Systems Consultant to £12,750 + Car

Acting as an adviser to senior management, the appointee will initiate and complete a wide range of high level assignments across the whole spectrum of Business Systems work and will assist with the longer term planning of the Company's Admin. System. Applicants should have considerable experience of conventional business systems techniques including O & M, Methods Study, CWM and equipment evaluation. A knowledge of 'office of the future' methodology and a degree or formal Business Studies or O & M qualification would be additional advantages. Preferred age is 27-36.
Ref. G861/2

Systems Analysts to £11,800

Developing advanced computer systems has always been a major factor in our client's success. Analysts with a flair for the business side of systems development, who are alert, self-motivated, and determined to build a worthwhile career will find the right sort of challenge. Strong analytical skills, drive and creativity are essential. Experience is less important than ability, but 2 years solid systems analysis experience is a minimum.
Ref. G861/3

All appointments enjoy substantial fringe benefits including a non-contributory pension, free life cover, BUPA, a profit sharing scheme plus an excellent relocation package.

TO APPLY
Please send a CV or write or telephone for an application form to JOHN KITCHEN, Executive Selection Division at the address below quoting the appropriate reference. Applications are invited from either sex.

BIS Applied Systems Limited
York House, 199 Westminster Bridge Road
London SE1 7UT
Telephone 01-633 0866

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Exper. PROGRAMMERS Herts
Minimum 2 yrs COBOL or ASSEMBLER experience
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Min. 4 yrs. programming to include 2 yrs systems
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This Authority is to develop and introduce a computer system capable of processing and providing prescribing and costing information from 320 million N.H.S. prescriptions submitted each year by more than 10,000 chemists and other contractors.

Currently 2,000 staff are employed to process this work manually in 8 centres situated in Northern England. The suitable candidate must be experienced in the design and implementation of computer systems.

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Salary Scale £8,017-£9,748 p.o.

The job entails controlling and supervising teams of Analysts/Programmers involved in Systems Design program writing, testing and implementation. The candidate will be closely involved with the users clarifying existing manual procedures and in the design of computer systems.

Application form, rate specification and further information available from Personnel Division, Prescription Pricing Authority, Bridge House, 182 Pilgrim Street, Newcastle-upon-Tyne NE1 8SN. Tel: Newcastle 283771.

Closing date: 12th November, 1980.

(3208)

PROJECT LEADERS

HODDESDON - BUTTON - S.W. LONDON - C. LONDON
To £10,000
Several projects are available for people with at least two years systems analysis/programme writing commercial and financial applications, able to lead teams of Analysts and Programmers.

CICS PROGRAMMERS

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£7,000-£10,000
Five of our clients are seeking CICS Programmers with experience of COBOL/PL/I or COBOL/VS. The requirements are of varying severity and applicants must have at least 18 months' experience.

ANALYST/PROGRAMMERS

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C. £8,000
COBOL Programmers with at least 2 years programming experience and at least one of those years should have been as an Analyst/Programmer. We also require COBOL/VS. Programmers with clients located in London and the Home Counties. Please phone to find out about the areas of interest you.

PROGRAMMERS

HODDESDON - BERKHAMSTED - CATFORD
C. £7,000
Senior Programmers £7,000. Programmers £6,500.
Experience required of COBOL with CICS, DOS/V or DL/1.
Please write with full details or phone for Application Form.

WATFORD

Chief Programmer £7,000. Lead Programmer £6,500.
Senior Programmers £6,500. Programmers £5,500.

Experience required of COBOL with CICS, DOS/V or DL/1.

AMES PERSONNEL

Employment Agency Suite 14, Dryden Chambers,
100 Oxford Street, London W1R 1PA Tel: 01 434 106

METROPOLITAN BOROUGH OF Rochdale TREASURER'S DEPARTMENT

SYSTEMS ANALYST (2 posts)

AP/502/CS973/E7722 (Ref. E200)

TECHNICAL SUPPORT

PROGRAMMER

AP/5/501 E5973/7077 (Ref. E201)

PROGRAMMER (3 Posts)

AP/2/6 CS980/E6381 (Ref. E202)

(Pay award pending for all posts. Salary related to experience)

Rochdale is currently implementing VME/K on a 2800 mainframe. New Systems are to be converted, older systems will be re-designed along with new Developments. To meet this ambitious programme the development staff is to be increased to a team of twenty.

For further information contact Mr. G. A. Martin, Rochdale 821100 Ext. 3313.

Application forms and further details are obtainable (by quoting appropriate reference number) from The Chief Personnel Officer, PO Box 58, 100 Shipton Street, Oldham, Lancashire OL1 6 LXG. (Tel: Rochdale 47474 Ext. 682) to be received not later than Monday, 10th November, 1980.

(3270)

OCC Contracts Personnel

Systems Analysts Senior Programmers

to c £25,000
+ Accom., Transport, etc.

Systems Analysts & Programmers with commercial experience on IBM 370 hardware are required, including DOS/COBOL, for the programming positions. Candidates, male or female, will ideally be graduates and 30+ years old. Long-term appointments available if preferred.

Compiler Designers Systems Architects

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+ Benefits

Requirements definition and design of Compilers, Operating Systems, Database & Comms. software for a new range of Mini hardware. Excellent long-term career prospects in a stimulating and expanding environment.

URGENT: IMS Systems Programmer 100,000+ DM

For further details, please contact us on American day/evening
OCC Contracts Personnel
1 Shiptonsway Park, Oldham, Lancs. OL1 6LX Ref. PL36
Closing date: 12th November, 1980.

(3208)

Berkhamsted (04427) 2299

PROGRAMMER

for
NCR CRITERION

Glossy magazine publishers in W1 wish to recruit
programmer with a minimum of 2 years' experience of NEAT/3 and/or COBOL.

Excellent working conditions in modern offices close to Oxford Circus and Piccadilly. Benefits include five weeks' holiday.

Please write giving full details of present salary and availability to:

Beverlie Flower
The National Magazine Co Ltd
National Magazine House
72 Broadwick Street
London W1V 2BP

(3268)

Newcastle upon Tyne

A major British company is in the early stages of establishing a major TP network serving subsidiary organisations throughout the UK. A substantial data centre is already established and is expanding rapidly in terms of workload, personnel and long term demands for its services. A large scale IBM system is installed and previous experience in a major IBM installation is required from candidates for the following positions. The company will negotiate excellent salaries in line with the indicators shown and generous relocation expenses. Salaries will be reviewed within six months.

These vacancies are all within the technical support group and are as follows:

Interested candidates should contact Ivor Norton quoting the appropriate reference in writing or by telephone at the Harrogate Office in order to arrange a confidential discussion.

Ivor Norton Management Services Ltd

RECRUITMENT CONSULTING DIVISION

24 HOUR ANSWERING SERVICE
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London NW1 7DE
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HARROGATE
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Harrogate HG1 1TS
01 734 8882

GLASGOW
11 Bothwell Street,
Glasgow G2 6LY
041 228 4911

In Announcement

Our client, one of the world's foremost oil companies, is consolidating its worldwide function of Petroleum Engineering and Exploration from its developed complex at Dhahran, Saudi Arabia. In support of these activities they are building one of the most advanced scientific/technical computer centres in the Middle East. The centre is due for completion by October 1981, and will consist of 4 3033's and some of the world's most sophisticated software. To assist in this massive program they urgently need to recruit SENIOR SYSTEMS ANALYSTS with between 3 to 10 years' experience with large IBM systems, and a background in PL/I or FORTRAN to work on Capacity Planning and Analysis. There are also numerous opportunities for GEOPHYSICAL SYSTEMS ANALYSTS who are conversant with seismic processing techniques or geological data management systems, and PETROLEUM ENGINEERING SYSTEMS ANALYSTS who are familiar with production, reservoir, and drilling engineering technical concepts.

These senior and challenging opportunities are offered to men or women educated to degree level, who could expect a starting salary of up to £21,000 net plus a benefits package which rates amongst the most comprehensive and generous in the Middle East.

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021-643 8501
Recruiting for clients

Computer Operations Professionals

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Start here for involvement with the European Space Agency — the organisation responsible for placing and controlling scientific, communications and other applications satellites for users throughout Europe.

We are in the process of final negotiations to contract to operate the Agencies' computer systems at the following locations:

Noordwijk in Holland,
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With negotiations nearly complete, we want to talk to operational staff who would be interested in taking part in what could be the opportunity of a lifetime. If you have experience on large scale computer systems, a professional attitude to computer operations and are interested in the most exciting

computer operations environment in Europe, we would like to hear from you, especially if you feel you could fill one of the following positions:

**CHIEF OPERATOR
SHIFT OPERATOR
SYSTEMS OPERATOR
PERIPHERALS OPERATOR
TAPE LIBRARIAN
KEY PUNCH OPERATOR**

Activities to be covered include scientific and general data processing; data preparation and library services. Operations

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For an application form contact: Lyn Williams, Sales Personnel Officer, Sunbury-on-Thames, 85511 (freephone charges) or write to him at RCA Service Division, Unit 1, Windmill Road, Sunbury-on-Thames, Middlesex.

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MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

NOTICE BOARD

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For more information contact Robin de Rouen on 01-637 9611.

Chief Programmer -

Croydon

£11K+

FREE INS., SPORTS FACILITIES, L.V.s

If you have at least five years' COBOL/ASSEMBLER programming, and experience of IBM 370 under DOS/VS, CICS and VSAM . . . we need.

Large two-mainframe installation, developing database and teleprocessing systems and investigating integrated information techniques.

Interested?

Ring Diane Williamson on 01-637 9611

This is difficult...

If you're the sort of sales professional who can rise to, and master a challenge, our client will guarantee you:

£13,700 + 2-litre car

They have a communications orientated small business systems product. Already highly successful in Europe and all set to penetrate the competitive U.K. market.

As for support you will have the full resources of an established name in the computer industry who will leave the creative selling up to you.

If you live East of London or in South Manchester, contact Tony McGrath on 01-637 9611.

Kawasaki
PROGRAMMERS
to **£6½K**

Kawasaki Motors, one of the leading motor-cycle manufacturers, is a company working in a young and exciting environment.

Programmers with 1 to 2 years' RPGII and/or COBOL experience can become part of their expanding data processing department. Database and on-line developments on the HP3000 mean involvement in challenging new projects for the successful applicant.

Hewlett Packard experience is preferred but training will be given to the right candidate.

Salary to £6½K plus a merit bonus, pension scheme, life assurance and four weeks' holiday.

Please contact Diane Oubridge on 01-637 9611

MANAGEMENT &
EXECUTIVE SELECTION

Systems Programmers

HOME COUNTIES

MVS/VM/VSI/VS

Requirement

extensive systems programming experience in one or more of

- * mainframe vendor
- * consultancy
- * user

Opportunity

wide-ranging Systems Engineer role

- * customer-based
- * installation of advanced software
- * SCP diagnosis and fix
- * systems consultancy
- * system cross - training

Environment

- * large mainframe manufacturer
- * rapid growth
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- * big company benefits (including competitive relocation package where appropriate)

To discuss your career aspirations and how our opportunities may help you to meet them ring Mike Henderson, on 01-572 7383 or write to him at: Amdahl (UK) Ltd, Viking House, 29-31 Lampton Road, Hounslow, Middlesex.

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to work on word processing, message switching, teleprocessing terminal emulation, telephone support, commercial packages, electronic mail and filing systems.

We want to talk to men and women with two or more years' experience of programming, using micro, mini or mainframe computers.

PLESSEY

Ring Peter Newman Chief Engineer - Office Systems, on (0602) 22157 or out of office hours on (0607) 72844.

Alternatively, send a brief c.v. or write/ring for an application form and Data Systems Limited, Beeston, Nottingham NG9 1LA. Tel: (0602) 254831.

SYSTEMS ANALYST/PROGRAMMER

Required by

Abingdon
carpets limited

We have a vacancy for a person who has the following experience:

- (a) at least two years' practical systems analysis experience
- (b) programming experience in COBOL
- (c) practical experience of implementing commercial systems
- (d) experience of data preparation system, mainframe operating systems and applications and, to a limited extent, personnel management.

Salary according to age and experience. Apply in the first instance to: Jane Barclay, Abingdon (0235) 27515.

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BCS 3030

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First-class experienced operator required for the above computer.

Wages according to qualifications and experience.

Please contact THE FINANCE DIRECTOR
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Successful applicants will receive first-class remuneration and will work with a go-ahead, progressive company.

Please bring your c.v. with you to the interview.

MAGIBOARDS LTD.
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(3213)

RN-SSK DIESEL-ELECTRIC SUBMARINE WEAPON SYSTEM NEW PROJECT: NEW OPPORTUNITIES SOFTWARE DESIGN ENGINEERS

The advent of a new class of submarine for the Royal Navy brings with it fresh opportunities for a system approach to the proposed weapon fit. As a significant part of a multi-million pound contract Vickers Shipbuilding Group Ltd, Weapons Department have been designated CO-ORDINATION AND SYSTEM DESIGN AUTHORITY with responsibility for overall system design development and performance amongst other tasks.

As part of the newly-formed team SOFTWARE ENGINEERS are required with particular responsibilities in a REAL TIME MICROPROCESSOR-based system for:-

1. Specification, design and implementation of software modules for submarine weapon guidance and target analysis systems using high and low level language.
2. Analysis of Mathematical and Statistical methods particularly those concerned with target tracking (e.g. digital filtering technique).
3. Assessment of overall system considerations concerned with the procurement of a total ship weapon system.

Experience of submarine operations would be desirable.

QUALIFICATIONS AND EXPERIENCE

Honours degree or equivalent in maths or applied science plus at least 3 years experience of Software design for Military and Industrial real-time systems.

The positions are open to both men and women.

Please write with details of age, qualifications and experience to:

Mr J. Richardson, Personnel Officer,
Vickers Shipbuilding Group Limited,
Barrow Shipbuilding Works, PO Box No. 6,
Barrow-in-Furness, Cumbria, LA1X 1AB

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UNIVERSITY OF BIRMINGHAM
MICROPROCESSOR SYSTEMS LABORATORY

COMPUTER OFFICER

Applications are invited for the post of Computer Officer within the University's newly-established Microprocessor Systems Laboratory. Preference will be given to applicants who are professionally qualified, have relevant experience and are familiar with the software and hardware of a range of microprocessor systems.

Salary will be on the scale £4,795-£8,095-£9,595 (under review), plus superannuation.

Further particulars are available from Mr R. W. Bushaway, Computer Centre, University of Birmingham, P.O. Box 363, Birmingham B15 2TT. Three applications (three copies) including a full curriculum vitae and naming three referees should be sent by Friday, 14th November, 1980. Please quote reference 6WXB. (3223)

SENIOR COMPUTING ASSISTANT

Required in Department of Economics, University of Reading. Some knowledge of economics and/or statistics desirable. Salary in scale £3,339-£4,416 p.a.

Apply for further particulars to Personnel Officer, University of Reading, Whiteknights, Reading RG6 2AH. (Ref. T.E. 49A). (3223)

KENT COUNTY COUNCIL

For sale by tender
GENERAL AUTOMATION MINITOM COMPUTER
about 3 years old, comprising: Hardware: 16/32 Processor, 32K of 16 bit word core random access memory, 10 Mb disc, 180 character per second matrix printer. Software: Basic, Commercial Fortran, Fortran. Further details from Contracts Officer, Kent County Supplies Centres, The Air Station, West Malling, Maidstone, Kent. (3278)

UNIVERSITY OF NOTTINGHAM

CHIEF PROGRAMMER

Required for the Administrative Data Processing Unit of the University of Nottingham which is replacing an ICL 1901A with an ME29 with three Disc Drives and two Magnetic Tape Units to support Workstations and Video Terminals for batch and on-line processing. The appointee will be responsible for two other programmers, program writing and maintenance and will assist in the design of new systems. Five years experience in Commerce or University data processing required. COBOL is essential and PL/I would be an advantage.

The appointment will be made in the salary range £4,795-£9,595 per annum.

Forms of application, returnable not later than 10th November, 1980, from the Staff Appointments Officer, University Park, Nottingham NG7 2RD. Please quote Ref. No. 757. (3211)

DOVENTRY (LAMBERTHORPE) POLYTECHNIC COMPUTER CENTRE TEAM LEADER

£7200-£7720 or £7207-£8007. Applicants should have a degree or equivalent in either Mathematics, Computer Science or other relevant discipline. Experience in management of projects in a scientific technological or commercial field. Arrangements for research towards a higher degree can be made.

PROGRAMMER/ADVISER

Applicants should have a degree or equivalent in either Mathematics, Computer Science or other relevant discipline. Experience of programming in a scientific, technological or commercial field would be an advantage. All the above quoted jobs are currently filled.

DETAILED NOTES: Details from Assistant Personnel Officer, Coventry (Lambethorpe) Polytechnic, Priory Street, Coventry CV1 5RL. Closing date: November 7, 1980. (3229)

Sales Executive

South Africa £30K

South Africa has one of the highest living standards in the world. Nixdorf Computer, in the midst of a burgeoning economic explosion, has a top opportunity for the right executive. You will be experienced in computer sales (ideally with some knowledge of Nixdorf's 8870 and 620) and have a good track record. You will know systems, be self-motivated and capable of negotiating at very senior levels.

Interviews will be conducted in the U.K. and the successful applicant will receive assisted family passage, removal expenses and medical cover etc.

Executive basic salary, fringe benefits and commission.

Incentives will enable you to enjoy a low tax, high sunshine life-style, at a level probably very different from your contemporaries.

Please write, including your curriculum vitae to:

John Fletcher, Sales Manager,
Nixdorf Computer (Pty) Ltd,
P.O. Box 7911
Johannesburg
South Africa

NIXDORF
COMPUTER

(3285)

Recruitment



In Informatics

IMS & DL-1 Professionals

Netherlands: Salary to £20K

A Dutch Systems and Software Consultancy based in Amsterdam has current requirements for Systems and Applications Programmers/Designers. Suitable Systems respondents must offer current or very recent IBM Programming experience with either DL-1 or IMS internals. The nature of the work will include the generation and implementation of new Software releases. liaison with in-house users will form an essential part of the job function. Applications Programmers will be concerned with the design, coding and implementation of Systems in the areas of: (a) sales and trend forecasting; (b) spare parts and inventory control and (c) budgetary assessment and forward planning. These positions represent an outstanding opportunity for both contract and permanent personnel to enhance their IBM skills. Ref: L43/A

Senior Commercial Programmers

City: Pkg. to £12K

The high salaries offered by this City-based institution reflect the importance placed on the acquisition of top quality personnel to assist in a major up-grade of their IBM installation. At least three, and preferably five, years' COBOL programming experience in an on-line environment is essential. Applicants who are, additionally, able to offer a knowledge of Assembler and familiarity with CICS internals will be especially welcome. The company's expanding development programme ensures that successful candidates will not only be exposed to "state-of-the-art" technology but will also be given the opportunity for rapid career advancement. Ref: L43/B

Microprocessor Engineers

Switzerland: Salaries to £15.5K (equivalent)

We have an exclusive assignment to recruit several Software Development Engineers to join the Company's permanent staff based in German speaking Switzerland. Engineers will be required to demonstrate technical achievement and in-depth knowledge/practical experience. A B.Sc. or M.Sc. Degree in Electronics, Electrical Engineering or Computer Sciences is a desirable asset. Additionally, all candidates must offer a minimum of four years' microprocessor software development. All respondents should be fully familiar with Motorola 6800, Intel 8085/8/ Zilog 280 hardware and software. It is preferable to offer some German language ability for social/cultural reasons as much as for the working environment. Of prime importance is a real enthusiasm to locate to Switzerland for a minimum period of 2 years. Assistance will be given in relocation including the cost of removal of all personal effects and the provision of temporary accommodation. Our clients offer an above-average salary together with an unrivalled range of ancillary fringe benefits. Initial screening interviews will take place in London. Ref: L43/C

Mini/Micro Assembler

E. Anglia: Salary to £10K

The MicroSystem Division of one of Europe's leading systems suppliers has a number of vacancies for Programmers with one to five years' Assembler experience on any leading mini or micro computer. An academic qualification in either Computer

Science or Electrical Engineering is advantageous but relevant industrial experience is equally welcome. Although particular applications knowledge is not a limiting factor, familiarity with on-line, real-time techniques is essential. Ref: L43/D

S/W Designers and Engineers

W. Country: Salary to £11.5K

One of Europe's renowned communications companies with a well-established and expanding Communications Development Group urgently requires dedicated real-time professionals for its "software workshop". Currently you should be employed as a Software or Development Programmer/Engineer and have 1-3 years' mini-computer or microprocessor Assembler experience. Some positions will require active and regular pre- and post-sales support, whilst others demand software and firmware development skills. Involvement with PDP11, VAX 11/780, System X orientated processors or Intel 8085/8 or Zilog 280-micros will be particularly advantageous. Candidates with a background in real-time military or defence applications are equally encouraged to apply. Interviews will be arranged on the Company's premises in this reasonably priced location. Ref: L43/E

Systems & Programming Consultants

Central & West London: Salary to £14K

An internationally renowned Systems and Programming Consultancy is currently seeking dynamic, ambitious professionals to join its specialist project teams. These positions will appeal to candidates who enjoy developing systems and solving related business problems. Suitable candidates will have a minimum of three years' programming experience on any commercial machine and of particular interest will be those who have a knowledge of COBOL and Assembler. You should have designed at least one complete system from feasibility to implementation and those who have experience of project leading, customer liaison or management will of course be considered for more senior positions. Ref: L43/F

Real-Time Applications

Surrey/Berks: Salary to £11K

nally, successful candidates will be expected to offer at least 12 months' analysis of either scientific or commercial systems. Project Leaders should have a similar background supplemented by actual or potential management abilities. Location is unlikely to be a limiting factor as the Company is well served by road and rail facilities. Ref: L43/G

Logistik, 10 Grenville Place London SW7 4RW

01-373 3063



Telex: 28800

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**ARCHITECT'S DEPARTMENT
COMPUTER APPLICATIONS OFFICER**

Salary to maximum £7722
(Pay award pending)

The successful candidate will be required to monitor and be conversant with computer developments and applications together with researching and advising on the new technology available which may be pertinent to the work of Architects, Quantity Surveyors and Engineers. In addition there will be a responsibility for supervising work carried for the development and efficient running of existing computer programmes at the County's mainframe ICL 2900 series computer in connection with the preparation of Bills of Quantities and the processing of the Official Job Costing System.

The successful candidate should therefore have experience with computer techniques ideally in the building industry, and preferably be able to write simple programmes dealing with technical subjects. Remunerating salary dependent upon age, qualifications and experience.

Application form, returnable by 7 November, from the County Architect, Springfield, Maidstone Kent.
(3277)



SENIOR ANALYST PROGRAMMER

Playtex Limited, operating from their U.K. headquarters at Port Glasgow, manufacture a wide range of branded personal and family products for the U.K. and European markets.

The D.P. function requires an additional Senior Analyst/Programmer who will be part of a small team providing D.P. support to all areas of the company. Some European travel may be involved.

The current equipment consists of an IBM System 3/150 with 128K for batch processing and a System 34 for on-line processing with local and remote terminals. Future plans include the installation of an IBM System 38 for which the database design work is underway.

Applicants should have a minimum of two years' experience using RPG-11 coupled with a knowledge of IBM System 3 and 34, preferably in a commercial environment.

Applications in writing to:

J. H. Boyle
Industrial Relations Manager
PLAYTEX LIMITED
Industrial Estate
Port Glasgow

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INTERACTIVE GRAPHIC SYSTEMS

A division of United Computing Systems Inc.

is an American-based company specializing in the production of computer systems for design applications. These systems can integrate discrete, printed circuit boards, memory and mechanical parts.

We are currently developing a new European customer support facility located in Kingston, Surrey. To support the expansion, we require the following staff:

1) SENIOR HARDWARE TECHNICAL SUPPORT ENGINEERS

Applicants should possess several years' experience as computer field service engineers. Experience in minicomputer or plotting equipment would be particularly relevant. c. £9,800+ o.s.t.

2) HARDWARE REPAIR CENTRE TECHNICIANS

Although previous computer experience would be desirable, applicants possessing a sound practical and theoretical grasp of electronics would be acceptable, as full training will be provided. c. £7,800.

3) DIAGNOSTICS PROGRAMMER

This position is likely to suit either a very experienced Technical Support Engineer or a specialist in application programming, or a Systems Programmer with a keen interest in hardware.

The work will involve writing and control of all types of diagnostics, and provision of technical support in situations where the exact nature of a problem requires definition. c. £10,000+ o.s.t.

4) HARDWARE TRAINING INSTRUCTOR

Required to set up a training department from scratch. Successful applicants should have a good knowledge of computers and be capable of planning training for a diverse range of products. c. £9,600.

Conditions of employment will reflect the high grade of people being sought and will be very competitive.

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(3288)

Programming Team Leaders

with DEC experience, up to £8000

After sixteen years of consistent and profitable growth, Hoskyns has broadened into one of the largest computer systems and service companies in the U.K. Hoskyns Systems Development is a market leader in the development and implementation of application systems for the Financial, Distribution and Manufacturing industries.

Our minicomputer business is growing fast, and we now need more senior programming staff with the ability to manage projects and help support our growing customer base.

Specifically, we are looking for programmers with team leading and minicomputer system design experience, preferably with knowledge of DEC's PDP II series and BASIC, to work in London, Birmingham or Manchester.

If you are interested in these positions please apply to Tony Winslade, Hoskyns Systems Development Limited, 145-157 St John Street, London EC1V 4QJ. Telephone: 01-251 4581.

hoskyns

Senior Programmer

£7362-£8823 inclusive (award pending)

You will be responsible to the Project Leader for all programming required by the team, and for supervising a small group of programmers. You should have at least 3 years' COBOL programming experience, and be able to motivate and control staff. Knowledge of George 1 and/or VME/B an advantage. Structured programming and on-line programme development techniques are used. We operate a 6 megabyte ICL 2872 and VME/B and an ICL 2960 under George 3 DME to support our expanding computer network and development plans based on a central VME/B service. We offer a 35-hour week with flexitime, 28 days' annual leave (plus 10 statutory/extra days), season ticket scheme and contributory pension scheme. Further details from Nick Wright (01-874 6464, ext. 235).

Application forms from Director of Finance, Town Hall, London SW1B 2PU (01-874 8484, ext. 350/378). Closes 11 November.

Wandsworth

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This is what we expect to pay for a Shift Leader with drive, enthusiasm and proven managerial experience to control a shift of 9 highly efficient operating staff. In addition a high degree of IBM technical knowledge of operating is required.

This vacancy has arisen because of the internal promotion of one of our Shift Leaders to the Technical Support Section.

Our operating teams work to very high standards and you will be required to maintain and enhance these in a dynamic environment.

Currently LOLA has a 6 megabyte IBM 370/158AP running under MVS JES2 supporting large IMS TP, TSO and API networks. An additional processor is currently undergoing acceptance tests on site to enhance the existing services.

Our requirements for this post are a minimum of 6 years' appropriate experience with at least two years' in a senior supervisory capacity. With slightly less than this you could be considered for the post of Deputy Shift Leader.

Further information and application form from Peter Anthony, Chief Operator, LOLA (London On-Line Authorities), Tower Point North, Sydney Road, Enfield, Middlesex EN2 6UE. Tel: 01-366 6611 (Ext. 266).

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Senior Systems Analyst

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Senior Systems Analyst

Richmond/City £11,000

Another major insurance company with two locations is anxious to recruit an Analyst with mini or maxi computer experience. Their installation includes both IBM and two types of minicomputer to cut your teeth on. A multiplicity of new and enhanced commercial on-line systems needs your attention, so apply now. They work flexitime and have other perks including an annual bonus and non-CPS. CW43/4. Michael.

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Communications Engineers

London based £9,000 to £12,000

Have you the sort of experience that covers in depth one or more of the following: FILE TRANSFER PROTOCOL, PACKET SWITCHING, NETWORK ANALYSIS, FILE TRANSFER, SYSTEM X, etc. If you have two years or more communications knowledge then this American computer engineering company will be very interested in you for brand new project work. Possibly some training in America. CW43/6. Michael.

Cobol Programmers — Where Are You?

London & Home Counties £8,000 to £8,000

If you are looking for a secure, rewarding future and have 1½ yrs. + experience, telephone us now for the very latest in COBOL vacancies in all manner of installations. Locations are BEDFORD, BRIGHTON, BUCKS, CITY, CHESHUNT, DAGENHAM, EDGWARE, HARROW, HARLOW, HAYWARDS HEATH, HIGH WYCOMBE, KINGSTON, LEATHERHEAD, N. LONDON, S.W. LONDON, W. LONDON, MAIDENHEAD, STANMORE, SURBITON & WELWYN GARDEN CITY. CW43/7. Tricia.

Operators

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A well-known insurance company requires computer operators with 1 yr. + experience on IBM 370 with DOS/POWER/CICS. They will shortly be updating to the new IBM range. There is a 3-shift system. Perks include subs cant., 4 weeks' hols, and free BUPA. CW43/8. Tricia.

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THE SALES BIT

Fair or unfair dismissal: Points to watch

LAST week I wrote about the rights of the employee during the period of notice. This week I shall continue with the dismissal process itself.

An employee who has been continuously employed for a period of more than one year has the right not to be unfairly dismissed by his employer. If he is dismissed in a manner which he believes to be unfair, he has the right to put his case before an industrial tribunal. This does not apply in cases where the employee is the wife or husband of the employee, where the employee has reached retirement age before the date of termination comes into effect, or where the employee is contracted to work overseas.

Once a case of disputed dismissal has come before an industrial tribunal the onus is upon the employee to prove that he was actually dismissed. Clearly, it is to the advantage of the employer to convince the tribunal that the employee actually resigned. However, if dismissal is proven or acknowledged by the employer, the burden of proof that such dismissal was not unfair lies with the employer.

The Employment Protection Act specifies five areas in which dismissal is acceptable, and unless the employer can state a principal reason for dismissal which falls into one of these categories, it is certain that a pronouncement of Unfair Dismissal will be made.

The permissible reasons for dismissal are:

1. The capability or qualifications of the employee for performing the work he was employed to do. This includes sickness.
2. The conduct and general behaviour of the employee.
3. Redundancy.
4. A legal restriction which makes continued employment impossible.
5. Some other substantial reason which justifies the act of dismissal.

The final category is rather broad, to say the least of it, but this is intended to embrace such situations as personality conflicts among employees, setting up or working

TRADER

Puzzle Answer

SHOT lengths of 125 and 150 metres will enable the course to be played as follows:

3x150-125, 1x150+125,
4x125-150, 3x125-150,
1x150+2x125, 2x150+125,

150, 2x150, 2x125

(3262)

LOLA

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COMPUTER WEEKLY

OCTOBER 30, 1980

RECRUITMENT & EDUCATION SUPPLEMENT

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In spite of rising unemployment the computer industry continues in its demand for a regular supply of qualified computer people. As the market expands, so does the need for new skills and abilities. Although more and more training facilities are available, the chronic shortage of manpower remains, causing a major problem for all companies involved with computers.

Our annual Computer Weekly recruitment and education supplement, especially planned to coincide with and be available at Compec '80 — Britain's biggest computer exhibition — will be packed full of valuable information covering the whole spectrum of the computer job market. Editorial contribution will be substantial, appealing to data processing professionals, as well as the next generation of young people who will be required to take up the

challenge and share in the achievements of the next decade and beyond.

This year's supplement will be published on October 30 and distributed in the normal way to all Computer Weekly readers. Copies will also be available to visitors from the Computer Weekly stand at Compec. Last year, some 34,745 visitors attended the exhibition.

The supplement is a unique publication, being the only newspaper of its kind produced in the U.K., dealing specifically with the subject of careers and job opportunities for DP personnel: *The combination of the supplement's extensive editorial support, the large circulation, and Computer Weekly's standing in the industry, means this supplement is a must for recruitment advertisers.*

For further details regarding the supplement and its special Compec *free* computerised recruitment service, contact your nearest Computer Weekly Classified Office: London: 01-261 8028/8019/8174/8097, Manchester: 061-872 8861, Birmingham: 021-356 4838.



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A SYSTEMS PROGRAMMER

with CIIH 66 experience. DMIV useful. French not essential.

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Minimum one year's experience with the ability to speak French. We are very interested if you have any one of the following:

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CIIH 66, 64	IDS, TDS
PRIME	UNIVAC any machine

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KUWAIT

SYSTEMS ANALYST

£15,000 p.a. TAX FREE (NEGOTIABLE)

Our clients are the main Kuwait Group of companies with multi interests throughout the world, including Construction, Banking, Finance and Real Estate. Their Construction Division, based in Kuwait City, has its own IN HOUSE computer. A SYSTEMS ANALYST is now needed to evaluate current software systems to conduct feasibility studies in incorporating state-of-the-art facilities, then implement and maintain the new systems.

Candidates should be aged 30-35 with relevant qualification and experience in Systems Analyst, probably with a Programming background. Knowledge of software in relation to construction activities, such as planning, resourcing and costing will be most helpful.

Benefits of employment include fully furnished married or single housing, company car, 2-year contract with paid home leave, etc.

For full details phone Mr. P. Luby on 0202 451711
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Engineers should have electronic knowledge and preferably some computer maintenance and peripheral experience.

A Repair Technician should also have electronic experience and be capable of fitting computer modules and power supplies as well as assisting with stores and spares.

We will provide Engineers with training where applicable, following which successful persons will become members of the engineering team which is involved in installing, commissioning,

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For Computer Engineers and Repair Technicians, contact Pele Mills. For Telecommunications Engineers, contact Ray Miles, Both on 01 351 4399. Or write to them at Comshare Limited, P.O. Box 197, London SW3 5RL.

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Although previous computer experience would be desirable, applicants possessing a sound practical theoretical grasp of electronics would be acceptable. As full training will be provided. c. £7,500

3) DIAGNOSTICS PROGRAMMER

This position is likely to suit either a very experienced Technical Support Engineer, possessing an aptitude for programming, or a Systems Programmer with a keen interest in hardware. The post will involve a wide variety of tasks, including the provision of technical support in situations where the exact nature of a problem requires definition. c. £10,000 - £11,000

4) HARDWARE TRAINING INSTRUCTOR

Recruit to set up a training department from scratch. Successful applicant to be able to demonstrate a capacity to understand computer requirements. Should be a good communicator and capable of planning training for a diverse range of products. c. £9,500

Conditions of employment will reflect the high grade of people being sought and will be very competitive.

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